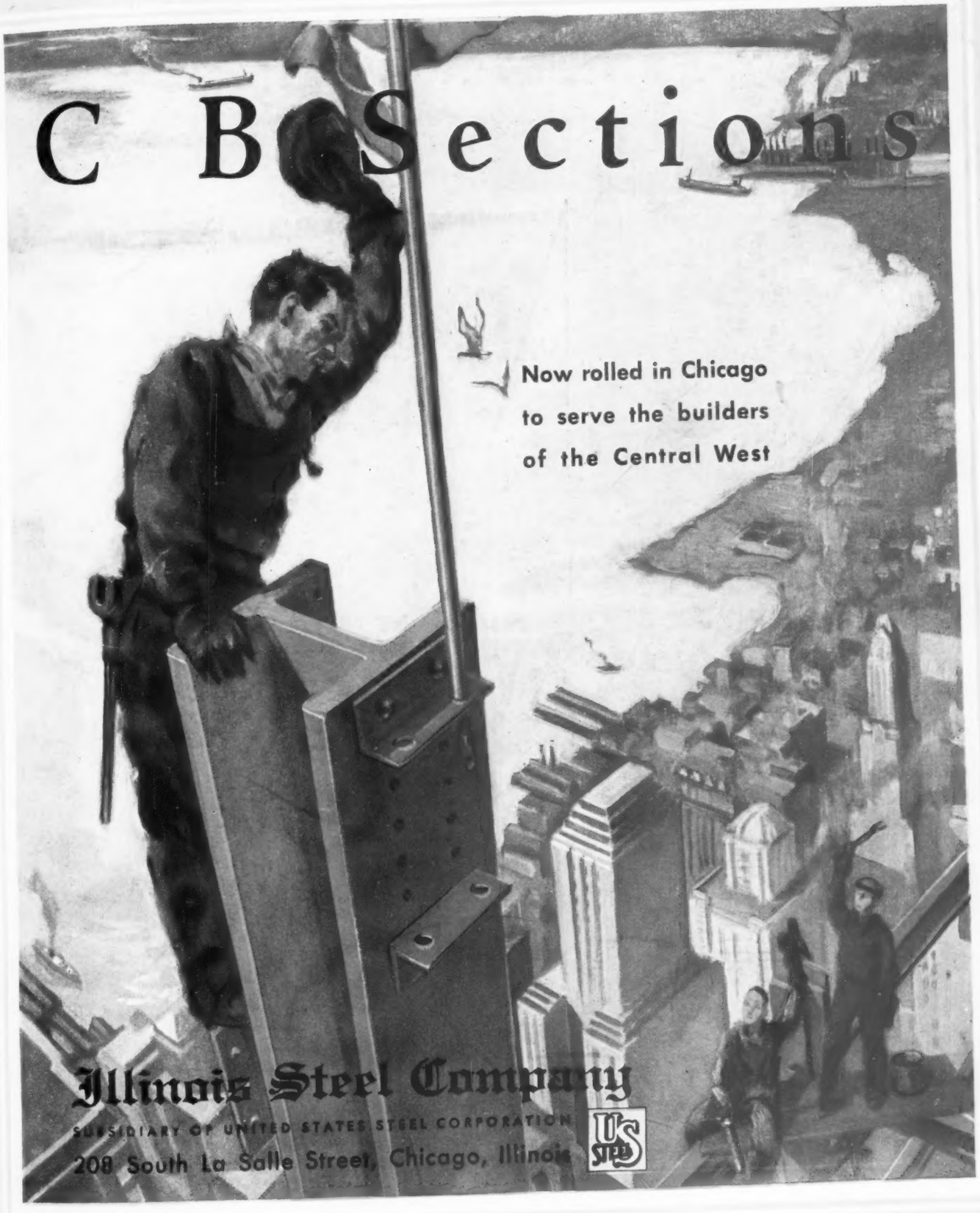
JUN 25 1931

STEEL

For forty-eight years—IRON TRADE REVIEW

June 25, 1931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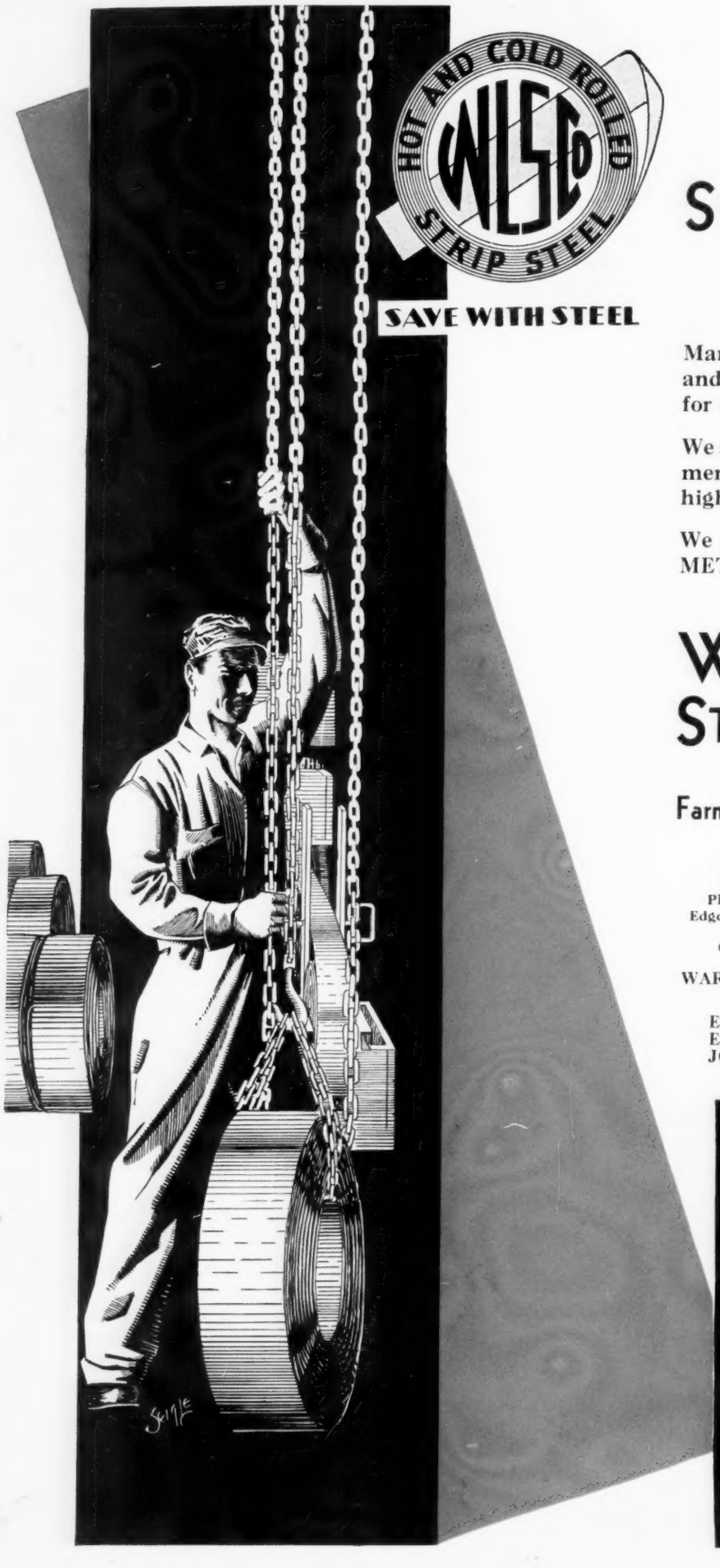

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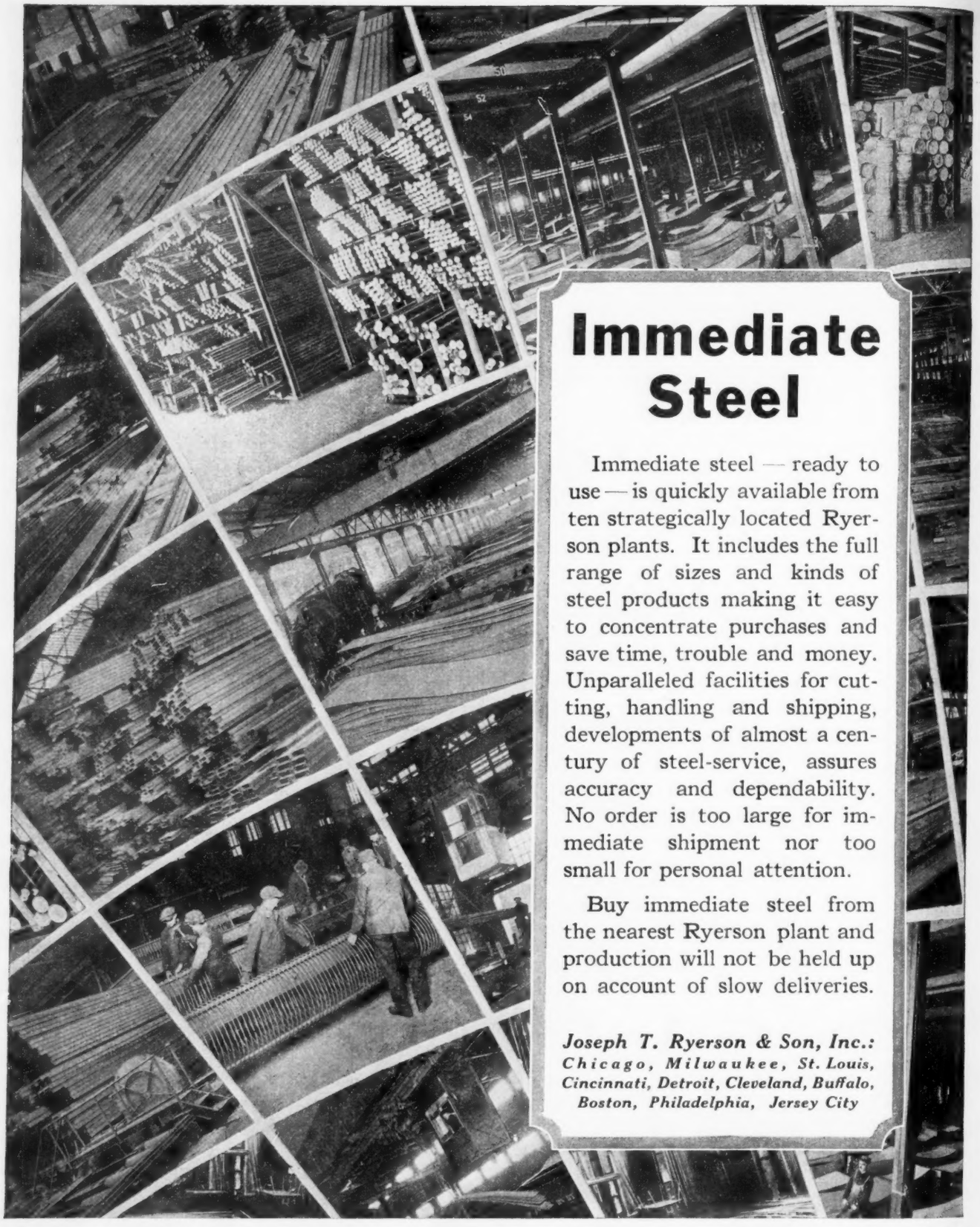

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Volume 88 Number 26

STEEL

For forty-eight years—IRON TRADE REVIEW

PRODUCTION ◆ PROCESSING ◆ DISTRIBUTION ◆ USE

This Week in Steel

INDUSTRY is struggling with a split personality. When it inventories its present situation, acknowledges the slack demand for commodities and recounts seasonal inhibitions, it can find little that is genuinely encouraging. Yet the will to be constructive is dominant, and industry, mirroring the humans which comprise it, is reaching out for improvement, is probing every political and business development for favorable aspects. And so, when the President proposes a year's suspension of war debt payments he finds industry avid to invest the gesture with its hopes. The proposal (Page 20) still is in the diplomatic test tube, but for steel there are potentialities in a succored Europe, a revitalized foreign trade and a sympathetic quickening of domestic markets.

Steel Sentiment Receives More Backing

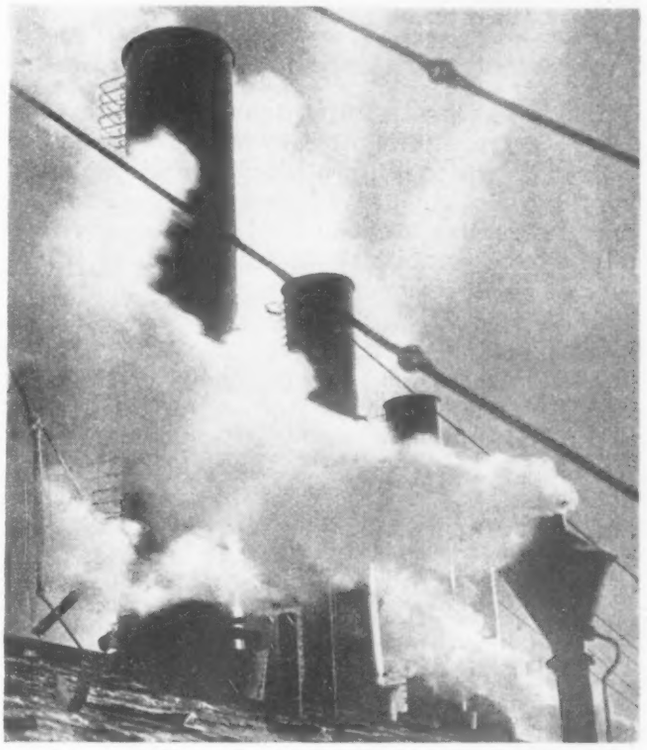
Steel was sensitive to this psychology last week when sentiment became noticeably buoyant in the face of further contraction in bookings and production. In a sense, steel foreran other business in acquiring the long view. This week the markets (Page 47) offer more tangible support to this sentiment. The award of 20,385 tons for an Ohio river bridge puts structural steel awards (Page 52) over 40,000 tons. A Mahoning valley mill has closed (Page 57) on 41,000 tons of line pipe. The largest rail inquiry (Page 51) in several months is pending. Steelmaking operations have fallen to 36 per cent, with some July shutdowns impending, but sentiment is keeping a stiff upper lip.

Prices Stiffen, Buyers Listen

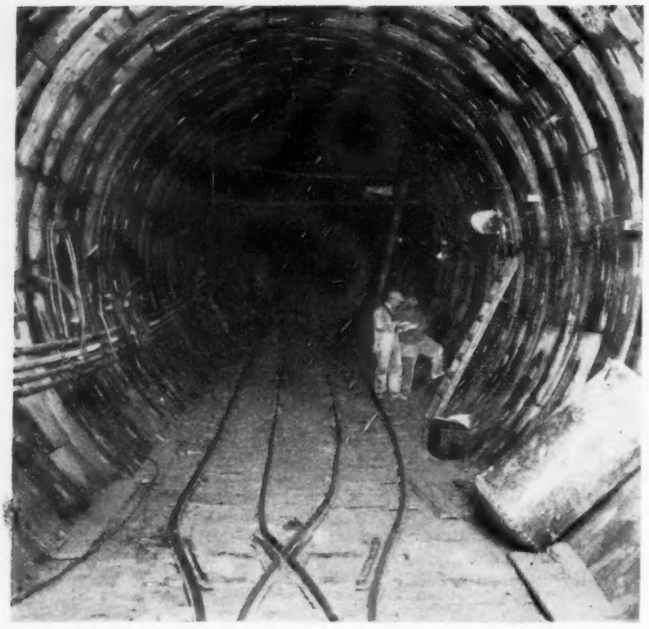
Prices probably will be first to afford convincing, tangible proof that the markets have turned. When a slight stiffening incites buying, then the green light will be flashing for industry. . . . Already the nonferrous metals (Page 73) display more firmness. . . . In sheets and strip the retreat from extreme bottom is under way (Page 47); in heavy finished steel, save for the concessions for attractively large lots, the market appears stabilized. . . . Structural fabricators are closing the wide gap between their bids which prompted James A. Farrell to deliver a stricture at the most recent Iron and Steel institute meeting. On 72,000 tons of steel, costing slightly more than $10,000,000, for the Golden Gate bridge, the high and low bidders (Page 68) were only $182,000 apart.

Tariff a Banquo at Washington

Even while the President is extending a helping hand across the sea, the tariff, which is not lacking in critics to blame it for accentuating the depression at home and straining relationships abroad, must rear its head. After considering foreign and domestic pig iron costs, the tariff commission has submitted a report (Page 17) which some believe recommends an



White plumes of exhaust steam soften the harsh lines of a mill exterior even in Red Russia



Water flows smoothly through this tunnel from the Detroit river to the Ford Motor Co. works at Fordson, Mich., but whether or not the tunnel shall be taxed has created friction between the company and Detroit. See page 77

increase in the duty. . . . Europe's steel industry, still engaged in self-help through the medium of its steel entente, is expected (Page 74) to renew the entente for July at least. . . . It is diminishing demand from Europe that has compelled (Page 19) the Newfoundland iron ore mines, with a year's stock on hand, to suspend.

A Pleasant Honeymoon—While It Lasted

Last week, at the first flush of the proposal, the 15 per cent freight rate advance which the railroads are seeking elicited considerable favorable opinion. Now, however, as various industries realize how much of the increase they might have to absorb—up to $2 per ton in the case of steel—comment (Page 15) is more critical. The practical side of paying higher freight rates is being weighed against the possible psychological effect upon commodity prices. . . . Railroad wages, which will be reviewed after rates are adjusted, in the last quarter of 1930 were the highest (Page 17) on an hourly basis in 17 years. . . . Less is heard of coal strikes, and it now appears that recent difficulties were as much a contest between rival mine labor organizations (Page 18) as between miners and employers.

Scrap Descends to Barter Level

For weeks the scrap trade has suffered the ignominy of a few grades being quoted (Page 65) less than $1 per ton, but a fresh humiliation results from the war department's arrangement (Page 19) to exchange scrap for powder, the ratio being 274 pounds of scrap for one pound of powder. . . . Almost simultaneously, the president of the Iron and Steel Scrap Institute was exhorting (Page 18) the trade to have confidence, refrain from "short" selling, and be salesmen instead of order takers. . . . For some support to its scrap industry, which it plans to build up, Russia will look (Page 18) to a new car works, designed to manufacture 55,000 railroad cars a year beginning 1933.

Steel for Comfort and Roadability

New automotive uses of steel are calculated (Page 25) to iron out the highways for at least two new automobile series. One manufacturer will utilize a dash-controlled cable to adjust shock absorbers to good, indifferent and bad highways. Another is mounting the motor on steel springs to abolish vibration. . . . Were it not for speeded production on these new series, automobile production would be in a rather precipitate decline; there are hopes, however, that July will arrest this tendency (Page 77). . . . Another new use of steel is in the manufacture of reels for heavy wire, cable and conduit, these reels (Page 39) accommodating longer lengths of wire and showing longer life.

Depression Also a Smoke Eliminator

Chicago's cleanup campaign has extended even to her steelworks, which have been publicly acclaimed for their contribution (Page 17) to smoke elimination, their progress being relatively greater than that of the railroads. . . . Even in these difficult times Chicago's "I Will" spirit penetrates the Chicago Superintendent's and Foremen's club sufficiently to impel 250 members to inspect (Page 19) machine tool plants at Cincinnati. . . . Machine tool builders are hopeful (Page 78) that the President's suggested moratorium on war debts will placate German buyers, still resentful over the tariff. Meanwhile the summer slump in the machine tool market has set in, but fundamental conditions are improving. The navy is active, and crane awards are noteworthy.

Wheels of Industry Run Smoother

Engineers continue to work toward the goal of a smooth-running industry. . . . Correct lubrication of machine bearings is the point where complete and continuous separation of rubbing surfaces is maintained by an oil or grease film with sufficient strength to resist operating pressures with a minimum of friction—at least so declared (Page 35) an authority at the Iron and Steel Electrical Engineers' convention. . . . High production rolling of steel has necessitated more effective lubrication of rolling mill gears and pinions, a new product (Page 33) for gear protection and bearing lubrication resulting.

I. C. C. Makes Railroads Be Specific in Rate Rise Case

WASHINGTON — Railroads are being asked by the interstate commerce commission if they intend to make any exceptions to their application for the 15 per cent freight rate increase, filed June 17, and if so "what specific exceptions they propose to make, and particularly whether they are prepared to make increases of the measure proposed in all existing rates" on iron and steel articles, nonferrous metals, automobiles and other specific commodities.

The question is put in a general order which the commission has issued, giving the railroads 15 days in which to file reply and in which other carriers can become parties to the new case. It will be known as ex parte 103.

Thus far no hearing date has been assigned for the case and it is not assumed that any will be set until after the answers to the general order have been filed, within 15 days. In the meantime, the statement and the application of the roads has been "received and filed." It has also been docketed and "the same be set for hearing as the commission may hereafter order."

Invites Written Appearance

In its order the commission states "that any steam railroad carrier which desires to avail itself of the benefit of the petition filed by the petitioners in their respective capacity shall cause its written appearance to be entered with the commission, through its officer or attorney thereunto duly authorized, or by a registered practitioner before the commission."

It is further provided that "any other carriers by railroad or by water may in like manner cause appearance to be entered for the purpose of becoming parties to this proceeding."

The commission has in mind, it states, the fact "that the carriers are equipped with traffic departments whose duty it is, among other things, to keep fully informed in regard to industrial and competitive conditions in the districts served by their lines and the ability of the traffic to bear existing or higher freight charges, and assuming that no increases in freight rates would be initiated which, in the opinion of those departments, the traffic cannot reasonably bear, or which for any other cause hold forth no substantial promise that revenue will thereby be increased, and being of the opinion that it is of prime importance, under present conditions, that industries and shippers should not find it necessary to participate in proceedings before the commission with respect to freight rates, if any there be, which the carriers do not in fact intend to increase even though the authority sought be granted."

The order states that "within 15 days from this date the petitioners or the carriers for which they speak, shall file with the commission their statement whether (1) they are prepared, if the authority sought in the application is granted, to initiate increases of all existing freight rates of the measure proposed in their application; (2) or if not, what specific exceptions they propose to make, and particularly whether they are prepared to make increases of the measure proposed in all existing rates on grain and grain products, cotton, other agricultural and horticultural products, including livestock, nonferrous metals, iron and steel articles, petroleum and its products, lumber, and automobiles, and in all existing class rates, and if not what exceptions as to these rates they propose to make."

International Rates Involved?

The commission further states that "it further appearing that the application seeks authority to increase all rail-and-water rates, as well as all rail rates, and it being uncertain from the application whether it is proposed to increase any international rates, it is ordered, that the petitioners within 15 days from this date state whether the statement and application of the steam railroad carriers of the United States as filed by them is intended to apply to any international rates, and whether it is tendered on behalf of or with the concurrence of the foreign rail lines, and also whether it is tendered with the concurrence of the water lines and carriers participating in rail-and-water rates."

Following a conference held here the latter part of last week between the commission and representatives of state railroad commissions it was announced that a committee representing these commissions would sit with the commission at the hearings. It was reported also that in order to complete the case that applications would be made by the railroads for higher intrastate rates.

A number of communications already have been received by the commission from members of congress and various associations complaining about any increase in freight rates at this time.

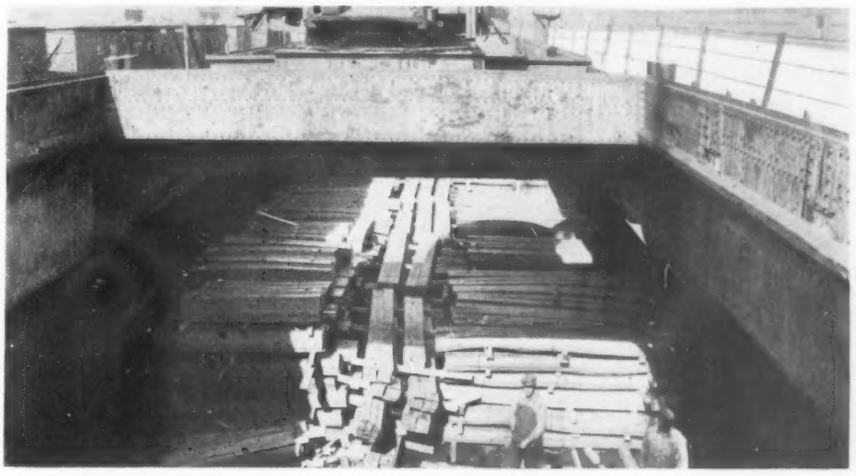
Representatives of the railroads were to meet at Chicago, June 24, to consider the commission's request for more specific data as to what rates would be raised. It is felt by railroad men that this request is slowing up the progress of the case.

Pittsburgh View of Rate Rise Is Largely Critical

PITTSBURGH—Unanimity of opinion regarding the desirability of effecting a general increase of 15 per cent in freight rates is distinctly lacking in this district.

On the one hand is the group that believes the maintenance of adequate transportation facilities warrants an increase in revenue when the efficiency of this service is jeopardized by conditions such as currently prevail.

On the other are those who maintain that the railroads are no more entitled to government aid than is any other industry whose income has been reduced sharply by present business conditions. Practically all types



ONE REASON WHY THE RAILROADS SEEK A 15 PER CENT ADVANCE
Part of a cargo of steel being moved from Chicago to Detroit by the Lake Ports Shipping & Navigation Co.

of business have suffered, it is pointed out, and all will share in the return to better industrial activity.

Few believe that an increase in rates will have any early effect on business, so far as purchases by the carriers are concerned. The rate boost petition is regarded to a certain extent as a political move and one that will possibly be carried over into the approaching presidential campaign. Furthermore, it will have the effect of quieting any concerted protest of stockholders as the result of the substantial decline in earning power.

Coal interests look with disfavor on the statement of the railroads that existing differentials between various districts will be maintained in the event of the effecting of the proposed rate increase. Laboring under an unfavorable rate structure in competition with other districts for business in the eastern and lake coal markets, western Pennsylvania producers would gain nothing from a general rate boost that left present differentials undisturbed.

The short haul rate structure on iron and steel products would continue unchanged under the proposed advance, so that recent efforts of Pittsburgh shippers in obtaining a scale comparable with those of other steel centers will not have been in vain.

Those who take the stand that a permanent removal to a reduced scale of values compared with those of the recent past now is in process are inclined to the view that the present is no time for an increase in rail rates.

How Pass Rate Rise Along, East Asks; Hope for Lower Short-Haul Tariffs

NEW YORK—Proposed freight rate changes continue an absorbing topic of discussion in the steel industry. While sympathizing with the railroads and in general becoming more reconciled to the idea of an increase in rates, steel producers in no sense are in accord in the belief that such an increase is a wise move, or, in some opinion, a fair move, in view of the struggle most industries are having in meeting their financial obligations, the steel industry in particular.

Nor is there complete accord in the belief that the steel industry would be able to pass on the burden of the added tariff—estimated at up to $2 a ton in the cost of finished products—to the consumer. Competition in steel has been and continues to be too keen and too reckless, in the opinion of many, for any such theory to work out, certainly not to any full extent.

It has been intimated by railroad executives that they would not seek to have the full 15 per cent apply in all cases, that there would be variations in the tariff put into effect, should their appeal be granted. Until the railroads make some definite statement as to what these variations would be steel interests must confine their remarks largely to generalities.

Meanwhile, there is a tendency on the part of commentators to search for other measures of railroad relief. Definitely committed to the policy of maintaining wage rates in their own industry, steel producers generally taboo thoughts of labor rate reductions in the railroad field. They do, however, believe that certain adjustments in railroad taxation and closer scrutiny of matters affecting bus transportation would prove not only helpful but also fair to the railroads.

Of immediate interest to steel producers is the pending action with regard to the proposed reduction in short haul steel rates applying rather generally throughout official classification territory. It is the hope and belief of steel producers and carriers alike that the rates will become effective about July 1. As noted previously, the rates have already gone into effect in the Pittsburgh territory where destination points up to 100 miles fall within the state of Pennsylvania.

Under the proposed reduction, rates from Bethlehem to such important consuming centers as New York and Brooklyn would be 15.25 cents per 100 pounds against 15.50c; to Newark, 13.25c against 14.00c; to Philadelphia, 10.5c against 12.00c; to Reading, 8.00c compared with 10.00c; and Allentown, Pa., 3.00c against 6.00c.

From Coatesville, Pa., to New York and Brooklyn the rate would be unchanged at 18.00c, the distance to the metropolitan district falling beyond the 100-mile limit, but to Philadelphia to Reading 8.00c against 10.00c; to Lancaster, Pa., 7.25c against 9.5c; and to Allentown, Pa., 12.5c against 13.5c.

The rate from Pencoyd, Pa., to Philadelphia would be 3.00c compared with 6.00c; to Reading, Pa., 12.5c against 13.5c. Philadelphia would take a rate from Conshohocken, Pa., of 4.5c against 7.00c; from Phoenixville, Pa., 6.5c against 9.00c; and from Claymont, Del., 4.5c against 7.00c.

Baltimore would take a rate Sparrows Point, Md., of 3.75c against 6.5c; from Coatesville, Pa., of 14.5c compared with 15.00c; from Claymont, Del., 14.00c against 14.5c; and from Pencoyd, Pa., 15.25c against 15.50c.

Chicago Looks for Repairs To Cars, Engine Buying

CHICAGO—Speculation on the early possibilities of buying in the railroad equipment market has been following the formal application of the railroads for an increase in freight rates. It is regarded with a degree of assurance that a large amount of repairs will be made and that much prolonged maintenance work will be started.

Whether the carriers will decide to act in the purchase of new rolling stock is not clear. It is known that one road is planning to buy cars after the additional revenues from the expected rate increase develop.

At the meeting of the western railroad officials here three weeks ago to decide on freight rate policies, it was pointed out that representatives of several roads had decided to put much of the expected added revenue back into service. Roads have estimated that delayed maintenance and repair work will cost 25 to 50 per cent more than if it had been completed as was needed.

While Class I railroads on May 15 had 166,001 freight cars in need of repairs, or 7.5 per cent of the number on line, according to the American Railway association, these figures are not entirely representative, it is stated.

Many almost new freight cars in western yards have been literally stripped of journal boxes, couplers and other parts, which have been removed for use on cars in service. Neglect of ordinary repair work is evident on every hand.

Exceptions to Be Made

According to railroad equipment interests, replacement of obsolete locomotives is one of the huge programs that must be completed before anything approaching efficient operation can be attained.

While iron and steel products apparently would be generally accorded a straight 15 per cent increase under the terms of the application, exceptions will be made covering certain points, particularly in view of some rate reductions in the last year or two when competition with other transportation has been involved.

As an illustration, late in April, Chicago & North Western and the Chicago, Milwaukee, St. Paul & Pacific railroads published a reduction of 6 cents per 100 pounds in the rate on certain heavy finished steel commodities from the Chicago district to Milwaukee and intermediate points, on minimum loads of 80,000 pounds, in order to meet the growing competition of Great Lakes shipping between Chicago and the Wisconsin consuming points.

This reduction was approved later by the interstate commerce commis-

sion. Rate readjustments of this nature are expected to stand without any increase, as higher rates now would undo some of these previous adjustments.

The application for higher rates has developed a more buoyant attitude among railway equipment interests. It is believed certain that favorable action by the interstate commerce commission will result in almost immediate activity in repairs and maintenance. One of the western car shops has increased its force recently to take care of existing and prospective repair work. Whether rolling stock will be purchased in any quantity is more doubtful.

Railroad Wage Rates Up But Earnings Are Down

Railroad employes' average hourly earnings in the last quarter of 1930 were higher than in any recorded period during the last 17 years, according to the National Industrial Conference board, New York. Its computations are based on the interstate commerce commission's reports, and relate to class I railroads, which comprise 92.2 per cent of the total railroad mileage in the United States, and employ 1,685,190, or 96.2 per cent of the total average number of railroad employes in the country.

"The increase," says the board, "does not necessarily denote a higher wage rate but may reflect merely an increase in the employment of more efficient workers, or a decline in the employment of less efficient workers."

Average weekly earnings, however, were about $1 less than in 1929. Compared with 1923, average weekly earnigns in 1930 showed an increase of $1.10, or 3.7 per cent. The decrease between 1929 and 1930 was due to the decline of 2.1 hours in the number worked per week. The average actual work week in 1930 was the lowest on record in 17 years.

Weekly earnings further decreased 25 cents in the first quarter of 1931, compared with the last quarter of 1930, indicating lessened work time.

Austin Notes Improvement

Substantial gains in the number of inquiries and of contracts placed during the last 10 days are reported by the Austin Co., engineer and builder, Cleveland. New construction work received during that period involves an investment of more than $500,000 representing diversified industrial buildings in various sections.

"There is growing evidence of a gradual upturn in certain industrial lnes," said W. J. Austin, president of the company. "Reports from our 17 district offices in the United States and Canada reflect underlying improvement in sentiment."

Tariff Commission Reports On Pig Iron Rate Change

WASHINGTON — United States tariff commission has submitted its recommendation for the pig iron tariff to the President. No information, under the present procedure, has been made public regarding the report either from the White House or the commission.

Unless the unusual develops, the first information on the rate will come when the President either issues a proclamation or declares that no change will be made in the rate.

The present tariff rate on pig iron is $1.12½ per gross ton. Should the full 50 per cent increase be granted, which is allowable under the flexible provisions of the tariff act, the rate could be increased to $1.68¾.

Under the tariff act of 1922, the rate of duty was 75 cents per ton, but this was increased following hearings by the tariff commission by President Coolidge to $1.12½, the present rate, which was retained in the present tariff bill.

During the course of the hearings before the commission practically no witnesses appeared opposing the tariff increase asked for.

As stated above, no definite information is available but there are rumors afloat both that the commission has recommended that the present rate be retained and that the rate be increased. Officials of neither the White House nor the commission will comment on these reports.

There was indication at the White House that it might be some time before the President takes any action on the commission's recommendation.

Lauds Chicago Steelworks For Smoke Elimination

Chicago—Extensive equipment to banish smoke has been installed in recent months by nearly a dozen large metallurgical plants on the south side of Chicago, removing these companies from the list of smoke offenders, according to Frank A. Chambers, head of the city's smoke abatement department. Mr. Chambers says steel com-

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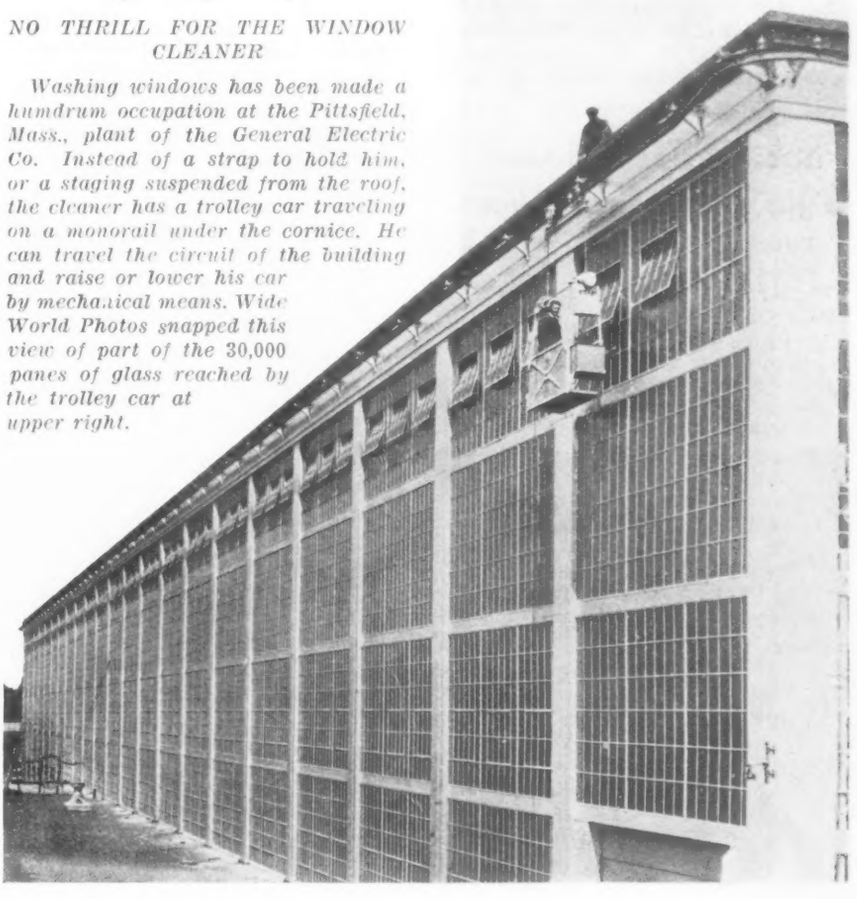
NO THRILL FOR THE WINDOW CLEANER

Washing windows has been made a humdrum occupation at the Pittsfield, Mass., plant of the General Electric Co. Instead of a strap to hold him, or a staging suspended from the roof, the cleaner has a trolley car traveling on a monorail under the cornice. He can travel the circuit of the building and raise or lower his car by mechanical means. Wide World Photos snapped this view of part of the 30,000 panes of glass reached by the trolley car at upper right.



panies and other industrial concerns have made much more rapid progress in the anti-smoke campaign than the western railroads.

Among plants which recently have completed installation of equipment are Illinois Steel Co. (South Chicago works), Wisconsin Steel Co., Youngstown Sheet & Tube Co. (Indiana Harbor works), Federated Metals Corp., and H. Kramer & Co. Improvements also include installation of a modern powder fuel plant at the McCormick works of International Harvester Co.

Interest in Merger Wanes As Suits Are Postponed

Youngstown, O.—Decreased attention is being paid here to the Bethlehem-Sheet & Tube merger case, trial of which began just one year ago before Judge David G. Jenkins. The recent postponement to July 23 of the hearing in common pleas court here to determine a "fair cash value" of Sheet & Tube shares as of April, 1930, held by stockholders who objected to the merger, also has lulled interest in the case.

It is understood the circuit court of appeals will not hear the merger injunction appeal until next autumn.

As to the disposition of the $1,772,000 withheld dividends in the hands of the Sheet & Tube company on the 300,000 shares of dissenting stock, the general impression here is that the company's directors may ask a court ruling. Ohio's newly amended law which affects this angle of the case will go into effect July 23. This may stir some action in the matter.

Pittsburgh Terminal Coal Signs With Miner's Union

Pittsburgh—An agreement was reached between the United Mine Workers and the Pittsburgh Terminal Coal Co., second largest producer in the Pittsburgh district, calling for a resumption of operations Wednesday, June 24. This directly affects 2400 miners, and provides for several wage increases, recognition of the union, and the right of miners to elect check weighmen. The contract is to extend to June 30, 1932.

Wage increases are established on the pick rate from 55 to 60 cents per ton, and from $3.50 to $4 per day for inside labor. The agreement also reestablishes the basic 8-hour day. This marks the first break of the strike in this district.

One miner was killed and nine others shot in a battle between deputies and strikers near the Wildwood mine of the Butler Consolidated Coal Co.

The National Miners union, the radical division of the strikers, has promoted and planned marches on various mines in the district and recently has attempted to enlist the aid of all idle workers in such demonstrations. Occasional clashes are noted at mines in the Ohio and West Virginia fields.

Russia Plans Car Plant

Construction has been started by the Soviet government on a carbuilding plant at Tagil, which is planned to have greater capacity for production of railroad cars than all existing plants in Russia. It is planned to turn out 55,000 four-axle freight cars per year. Selection of the location is based on the development of metal industries at Novo-Tagil. The car plant is planned to be in production during first quarter of 1933.

Taylor Lauds Moratorium

New York—Myron C. Taylor, chairman of the finance committee, United States Steel Corp., on returning from abroad states that the President's proposed moratorium on war debt payments "should be considered as a first rate constructive move here and should be appreciated abroad."

Say Visit Was Personal

Birmingham, Ala.—It is stated that the visit of W. L. Allen, president, Sheffield Steel Corp., Kansas City, Mo., subsidiary of the American Rolling Mill Co., at the Gulf States Steel Co. plant last week was purely personal.

Illinois Employment Trend Similar to Years Ago

Chicago—Illinois employment and payroll figures for May showed a decline of 1.4 per cent and 3 per cent, respectively, according to the Illinois department of labor. The statistics are based on reports of 1027 establishments. This year's curtailments during May were virtually of the same proportions as those of a year ago, with a decrease of 1.7 per cent in employment and 2.9 per cent in payrolls. The decrease of last year was state wide, while the decrease this year is centered largely in the Chicago area.

The Illinois chamber of commerce has completed a nation-wide survey of wages, based on the preliminary summary of the 1929 census of manufacturers, which shows Illinois second only to Michigan in average payments to employes. New York was first in the number of manufacturing establishments, with a total of 39,360; Pennsylvania second, with 16,870; and Illinois third, with 15,327 plants.

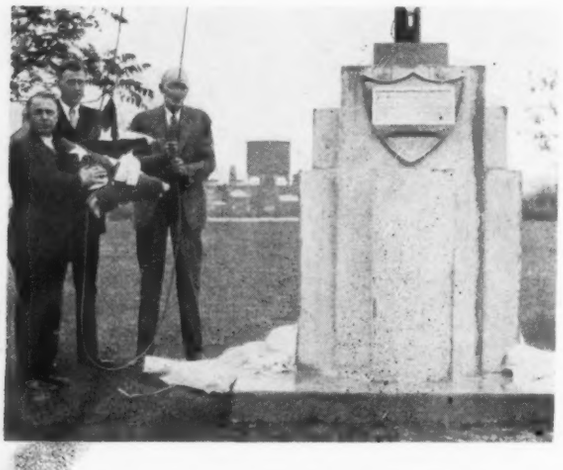
Steel Trade Board Has Fourth Annual Outing

Philadelphia—Structural Steel Board of Trade of Philadelphia held its fourth annual golf tournament and outing June 16 at Sandy Run Country club, Camp Hill, Montgomery county, Pa. W. Nelson Mayhew, president; Dr. Frank Parker, director; and Edward H. Cushing, an authority on building laws, were among the speakers.

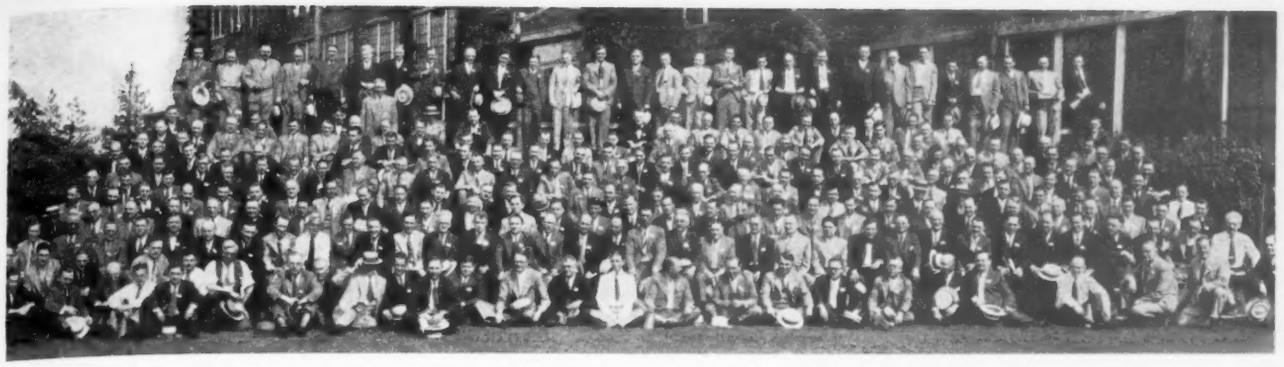
Scrap Dealers Urged To Meet Upturn with Caution

Forgetting present conditions surrounding steel and iron scrap as soon as a return of better conditions comes, and a new start in careful merchandising of their commodity along business lines, were urged on dealers in the Chicago district by Herman D. Moskowitz, president of the Institute of Scrap Iron and Steel Inc., in an address to the Chicago chapter June 17.

"We must forget the bad experiences we have learned in this buyer's market and we must become as we have been before, the sellers of our commodity and not order takers. There are indications of a business upturn in the near future, after the



A tablet in Durimet, a chrome-nickel-silicon alloy steel, on this memorial flagstaff base recites that it is "Erected to the memory of Peirce Davies Schenck, founder of the Duriron Co." Durimet was the invention of Mr. Schenck. The concrete base was designed by Dale Augsburger, an employe in the Dayton office. Duriron Co. is located at Dayton, O.



CHICAGO SUPERINTENDENTS AND FOREMEN GO TO CINCINNATI TO INSPECT NEW MACHINES

In dull times prepare for a revival of activity—this was the thought impelling 250 members of the Chicago Superintendents' and Foremen's club to make a trip by special train recently to Cincinnati where they visited the plants of the Cincinnati Milling Machine Co., Cincinnati Grinders Inc., and foundry divisions. Eighteen large Chicago manufacturing companies were represented. The superintendents and foremen formed into groups, inspected their hosts' machines, and witnessed demonstrations. In the afternoon they went on a sight-seeing trip in the city. W. F. Coleman is president of the club and Charles Blatchford, secretary

regular seasonal quiet which we undergo in the steel business, a return which will be slow but sure, leading to an unprecedented era in the scrap industry.

"In our adjustment to new conditions a cautious note of conservative operation must be sounded. We must be ready, alongside of others basic industries, to resist ruinous underselling. The volume of business, the return of which cannot be expected in leaps and bounds but which will come in an orderly manner, will be sufficient for us all, if purchases and sales will be made on lines of good merchandising practice. In my opinion this is no time to sell our industry short."

Denies Trade Codes Ended

Washington — Persistent reports have been spread throughout the country that the federal trade commission has definitely abandoned the trade practice conferences, said Commissioner Humphrey, June 23. These reports, he said, "have been so persistently circulated as to strongly suggest propaganda. Such reports are wholly false and have no foundation whatever in fact."

Car Shops Add Men

Chicago—Railroad shops in this territory continue to add to their forces, although repair activity shows little change. Chicago & Alton railroad shops, intermittently idle for six months, have reopened. Illinois Central railroad has taken back 700 shop employes throughout its system, 150 being in Chicago shops.

Newfoundland Mines Close

Dominion Steel & Coal Co., St. John, N. F., has closed its mines for an indefinite period, its iron ore stocks being sufficient for a full year.

Scrap Traded for Powder At 274 to 1 Ratio

New York—Iron and steel scrap is worth hardly as much as the powder to blow it up, in the opinion of the chief of ordnance, war department. As a matter of fact, the ordnance officers would rather have powder, so they offered to trade 4,863,250 pounds scrap steel for as much FNH powder as it would bring, opening proposals for the material on this basis.

Boston Iron & Metal Co., Baltimore, offered one pound of FNH powder for each 274 pounds of the scrap and the offer was accepted. Luria Bros., Reading, Pa., offered one pound of powder for 360 pounds of scrap and N. Block & Co., Norfolk, Va., would have given one pound of the explosive for 362 pounds of old metal.

The trade results in the department giving about 2432 tons of scrap for less than 9 tons of powder.

Although DeSoto failed to find the fountain of youth in Florida, a cast iron shield lost by one of his knights has attained immortality. After being buried nearly 400 years in the clay under what is now Atlanta, Ga., it was dug up a few months ago and retains the full detail of ornamentation of its youth, as the illustration shows. The style of ornamentation gives authentic date to the workmanship, states the United States Pipe & Foundry Co.

Two Symposiums Headline Testing Society Meeting

Chicago—Attendance at the annual meeting of the American Society for Testing Materials being held there at Hotel Stevens exceeded registration at the meeting last year, 850 being registered as technical sessions opened June 23.

Outstanding events of the meeting were two symposiums, one on the effect of temperature on the properties of metals and the other on malleable iron castings. Twenty-seven papers were discused at the former, covering a wide range of industries. Announcement was made that a symposium on steel castings will be featured on the program for the next annual meeting.

The second revised edition of the engineering students' book of standards will be available for the spring term of 1932, according to C. L. Warwick, secretary of the society; work is now in progress on a similar type of book for students in chemical engineering and allied fields.

Parts Employes Return

Chicago—Stewart-Warner Corp., automotive accessories, has put back to work about 1200 of its employes, and announcement is made that 500 or

600 probably will follow them into the various departments within a month.

Steel Barrel Production And Shipments Off

Steel barrel making percentage of capacity used during May was 27.3, compared with 31.9 for April and 33.2 for March. Total daily productive capacity was 45,350 units, of which 10,025 were I. C. C. barrels and 35,325 light barrels, according to the Steel Barrel Manufacturers' association, Cleveland.

Shipments in May totaled 339,795 units, against 346,907 during April. This is the first decline after four successive monthly increases in 1931. Total number of barrels on unfilled orders as of May 31 was 338,831.

May Coke Production Follows Pig Iron Down

Reflecting a recession in pig iron output, production of coke again declined in May, while stocks on hand increased. These changes affected both merchant and furnace plants. Eighty-eight plants were active in May and produced about 60 per cent of their capacity, according to the department of commerce. Comparisons follow:

In net tons

1930	By-product coke	Beehive coke	Total coke
April	4,246,436	301,700	4,548,136
May	4,265,528	272,000	4,537,528
1931			
April	3,146,490	108,600	3,255,090
May	3,125,571	93,900	3,219,471

Foundry Equipment Orders Hold to April Level

May's index of foundry equipment orders shaded the April figure slightly, yet remained practically at the level of February and April. May cancellations were virtually nil. Index of shipments rose from April's 69.7 to 118.6 in May; index of unfilled orders dropped from April's 180.07 to 123.8 in May, both indicating working off of May orders which are the high point to date for 1931. Index comparison follows of gross orders only;

	1931	1930	1929	1928
Jan.	65.3	160.1	180.5	132.7
Feb.	54.7	196.4	197.0	123.6
Mar.	174.4	164.1	209.4	138.6
Apr.	57.7	122.8	172.6	107.7
May	54.1	92.7	177.7	335.6
June	.....	102.1	177.3	149.1
July	.....	90.6	219.3	94.8
Aug.	.....	85.2	229.5	278.0
Sept.	.....	91.0	216.3	170.0
Oct.	.....	50.0	245.3	185.0
Nov.	.....	45.3	128.6	197.8
Dec.	.....	59.8	208.0	166.5

Base: Average monthly shipments for 1922-23-24 taken as 100.

May Makes Good Gain in Mechanical Stokers

Eighty stokers of 23,646 horsepower were sold in May, the second highest monthly total for 1931 and representing the third consecutive monthly advance. Gain was largely in water-tube boilers. Leading manufacturers report their sales in total as follows by the department of commerce.

	Stokers sold	Fire tube boilers	Water tube boilers
1930			
May	96	41	55
5 mo.	419	182	237
June	151	70	81
July	150	83	67
August	115	61	54
September	128	71	57
October	92	46	46
November	71	41	30
December	53	35	18
Year	1,179	589	590
1931			
January	85	40	45
February*	66	37	30
March	63	27	36
April	65	32	33
May	80	29	51
5 mo.	359	165	194

*Revised.

Truck, Tractor Foreign Business Slumps in May

Domestic shipments of electrical trucks and tractors improved during May, but due to an absence of export business the total was barely comparable with April. Five months of 1931 lag almost 50 per cent behind the corresponding time of 1930. Leading makers reported the following to the department of commerce:

		——Shipment——	
1930	Total	Domestic	Export
May	144	125	19
5 mo.	644	582	62
June	95	63	32
July	108	99	9
August	92	81	11
September	81	75	6
October	93	90	3
November	45	36	9
December	51	42	9
Year	1,191	1,050	141
1931			
January	38	33	5
February	56	50	6
March	93	84	9
April	71	48	23
May	69	69	.....
5 mo.	327	284	43

Washington Sees War Debt Delay as Business Aid; What's Doing at Capital

PRESIDENT HOOVER'S proposal for a one-year suspension of all war debt payments again focuses the attention of the business world upon Washington. There is a feeling that the proposal may make for better international feeling and prove a stimulus to foreign trade; indeed, coming on the heels of the railroad's petition for higher freight rates it might provide the psychological pivot business has been looking for. It is assumed that Secretary Mellon, now in Europe, previously sounded out important European governmetns.

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Announcement has been made that the fourth Pan American Commercial Conference will be held in this city beginning October 5.

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Considering the proposal for a 15 per cent rise in freight rates, the interstate commerce commission has asked the railroads to specify which rates they would advance, in order to clarify the hearings and obviate the necessity of unaffected shippers appearing. The railroads have until July 6 to amplify their petition.

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The United States possesses limited resources of high grade manganese ores, but does have great deposits of material containing from 5 to 35 per cent of this metal, according to reports to the bureau of mines.

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The treasury department has announced that as the result of the first year of the new tariff law income collected from that source amounted to $416,956,000 which was the duty on merchandise imported during the year valued at $2,427,952,000.

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The American trade commissioner at London reports that sales of Russian goods in Great Britain increased $40,000,000 last year over the previous year.

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The bureau of labor statistics announces that a decrease of 19.5 per cent in estimated costs of structures covered by building permits issued in 342 of the larger cities of the country is shown for May.

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Reports received by the President's emergency committee on employment this week do not show any great change in the situation one way or another, although better business conditions were reported from several cities.

Industrial Men in the Day's News

Fred Grotts, Metallurgical Engineer, Continental Roll & Steel Foundry Co.

GRADUATING from college as a metallurgical engineer, he has pursued that study practically all of his business career.

EMPLOYED by a public utility, then by an airplane manufacturer and a tractor builder, he next was engaged by important steel foundry interests.

CONSIDERED an authority on heat treatment of cast steel and cast iron, he has written many papers on those and allied subjects.

PUBLIC utility, airplane, tractor, gray iron, steel casting and other metallurgical experience have in turn marked the varied business career of Fred Grotts, who as metallurgical engineer became affiliated on June 1 with Continental Roll & Steel Foundry Co., East Chicago, Ind.

While his headquarters will be at East Chicago, where he will direct all the metallurgical activities of the Hubbard Steel Foundry division, he also will have under his jurisdiction the metallurgical activities of the Wheeling Mold & Foundry division, Wheeling, W. Va., and the Duquesne Steel Foundry division, Corapolis, Pa. For some time he has been superintendent of wheel foundry, American Steel Foundries, Granite City, Ill.

Mr. Grotts attended the University of Illinois, Urbana, Ill. and also the University of Missouri, Columbia, Mo., graduating from the latter institution with the degree of bachelor of science and metallurgical engineer. After spending some time as industrial metallurgical engineer with the Public Service Co. of Northern Illinois, large public utility interest of Chicago, he became affiliated in 1916 with Curtiss Aeroplane & Motor Corp., Buffalo, as metallurgical and chemical engineer. In his offical capacity he had technical control over all processes and rendered much valuable service during the World war. For these efforts he was cited by three nations—United States, Great Britain and France.

Following the armistice, he became connected with the Caterpillar Tractor Co., Peoria, Ill., and was made foundry manager as well as technical supervisor of the plant. After seven years service he left to go with American Steel Foundries, Granite City, Ill., as superintendent of the wheel plant, from which position he resigned recently to assume his new connection.

Mr. Grotts is an authority on the heat treatment of cast steel as well as cast iron. He has written and presented numerous papers on these and kindred subjects before various technical associations.

ROGER W. ANDREWS, assistant to the president of the Blaw-Knox Co., Pittsburgh and Blawknox, Pa., manufacturer of steel products, has been made vice president and a director of the Blaw-Knox International Corp. Mr. Andrews, who will reside in Paris, France, will be in charge of the company's European activities, succeeding C. T. Clack, who recently died in Dusseldorf, Germany. Prior to becoming affiliated with Blaw-Knox interests, Mr. Andrews operated his own company, Andrews-Bradshaw Co., Pittsburgh, specializing in power plant and engineering equipment. This company was merged Jan. 1 1928, with Blaw-Knox Co., and Mr. Andrews was made manager of the steam, gas and air purifier division, in which position he served until the spring of 1929, when he was appointed assistant to the president.

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E. E. Griest has been appointed vice president in charge of manufacture for Chicago Railway Equipment Co., Chicago.

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Gus G. Meyer, formerly identified with the W. J. Holliday Co., Indianapolis, has become associated with Barrett Steel Sales Co., that city. The company represents several eastern sheet, pipe and conduit mills in Indiana.

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R. D. Bean formerly manager of the engineering development department of Brown Instrument Co., Philadelphia, has been appointed chief engineer.

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Gilbert L. Hartman, purchasing agent, Oilgear Co., Milwaukee, has been elected president of the Milwaukee chapter, National Association of Purchasing Agents. Samuel Wilson, Kearney & Trecker Corp. was elected vice president; Herbert A. Frank, Sterling Wheelbarrow Co., secretary,

and Walter Rust, treasurer. Fred R. Goerke, of Gilson-Bolens, Port Washington, Wis., was elected to the board of directors.

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Paul Leoni, president of William H. Muller & Co., 122 East Forty-second street, New York, ore importers, has sailed for Europe for a 6 to 8 week stay.

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Gordon Fox and W. S. Orr, who have been in soviet Rusia for the past ten months as members of the engineering staff maintained there by Freyn Engineering Co., Chicago, have returned to the United States.

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H. R. Bowers, formerly with Bailey Meter Co., Cleveland, now is manager of sales and advertising for the Meriam Co., Cleveland, manufacturer of flow meters.

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Louis Sandler, works manager, Johnson Bronze Co., New Castle, Pa., has been promoted to vice president and in that capacity becomes assistant to P. J. Flaherty, president.

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L. F. DeLargey, for the past two years purchasing agent for the Wilcox-Rich Corp., with headquarters in Saginaw, Mich., has been transferred to the corporation's general offices at Detroit. Prior to his present connection, Mr. DeLargey was purchasing agent for the Wilcox Products Corp.

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Pichegru Woolfolk, associated with the Bartlett Hayward Co., Baltimore, founder and machinist, since graduation in 1914 from the University of Virginia, has been appointed assistant general manager. He has served in all branches of the company's activities.

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W. S. Guy, traffic manager of Carnegie Steel Co., Pittsburgh, has been elected president of the Traffic Club of Pittsburgh. E. M. Garland, general traffic manager, Pressed Steel Car Co., has been made first vice president and S. B. Duff, assistant traffic manager, National Tube Co., has been elected treasurer.

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Samuel M. Vauclain, chairman, Baldwin Locomotive Works, Philadelphia; Aldus C. Higgins, treasurer, the Norton Co., Worcester, Mass., and Charles E. Eveleth, vice president in charge of Schenectady, N. Y., plant of General Electric Co., received honorary doctor of engineering degrees at the recent commencement exercises of Worcester Polytechnic institute.

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Chester B. Gleason has resigned from the executive department at Cleveland of Republic Steel Corp., Youngstown, O. For several years he was sales statistician of Sharon Steel Hoop Co., Sharon, Pa., but in 1928 became affiliated with the Republic organization when it absorbed Trumbull Steel Co. Since September, 1930, he has been identified with Republic's Cleveland office.

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C. G. Carter, vice president and treasurer of the Liquid Carbonic Corp., Chicago, has been placed in charge of sales, succeeding Carl J. Palmer, who resigned to become vice president of the Bastian-Blessing Co., Chicago.

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Robert McMillan, purchasing agent of the Pittsburgh Steel Co., Pittsburgh, and subsidiary companies, who as noted in STEEL of June 4 has announced his retirement, effective July 1, has been identified with the iron and steel industry for nearly 45 years.

Roger W. Andrews

He became associated with the H. C. Frick Coke Co. in 1886 as assistant purchasing agent, holding this position for ten years. A short period outside the iron and steel industry was followed by his joining the American Steel & Wire Co. as Pittsburgh district purchasing agent in 1899. He retained this office until 1910 when he became purchasing agent of the Pittsburgh Steel Co. Mr. McMillan completed 21 years of service with this company June 10.

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Jack L. Hilton, president and treasurer of Hilton Steel Co., Warren, O., engineer and fabricator, formerly was manager of Dalzell Bros Co., Youngstown, O. At one time he was manager of the contractors' equipment division of Commercial Shearing & Stamping Co., Youngstown, O., and prior to that was general superintendent of Heltzel Steel Form & Iron Co., Warren, O.

A. F. Steele is secretary of the Hilton Steel Co. He has been accountant of Brainard Steel Corp., Warren, O., ad formerly was traveling auditor for Wells-Fargo Express Co.

R. A. Zeyfang, formerly shop superintendent of Dalzell Bros. Co., Youngstown, is vice president in charge of production of the Hilton company. He formerly was estimator in the plate department of Commercial Shearing & Stamping Co.

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Thomas H. Morcom, assistant superintendent of General Railway Signal Co., Rochester, N. Y., was recently promoted to factory superintendent, to succeed the late Frank H. Banner.

Mr. Morcom was born in Jerry, Pa., and was graduated from Carbondale Commercial institute. He became piece-work inspector at the Sayer shops of Lehigh Valley railroad in 1908 and later served as assistant toolroom foreman for General Railway Signal Co. During the World war he was division superintendent at the United States naval gun plant at Rochester, N. Y., and for the past 12 years has been with the General Railway Signal Co. as assistant production manager and assistant superintendent.

Robert H. Parks, identified with the General Railway Signal Co. for some time past has been made assistant superintendent to succeed Mr. Morcom.

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Alexander L. Feild, formerly research engineer, Simonds Saw & Steel Co., Fitchburg, Mass., now is director of development and research for the Rustless Iron Corp. of America, New York and Baltimore. Following college, Mr. Feild became assistant chemist at the North Carolina experiment station. In 1914 he joined the United States bureau of mines at Pittsburgh as junior physical chemist, later becoming assistant metallurgist. From 1917 to 1925 he was with several subsidiaries of Union Carbide & Carbon Corp. as research physical chemist, National Carbon Co., research metallurgist, Electro Metallurgical Co., and later in the research laboratory of the parent interest. From 1925 to 1927 he was with Central Alloy Steel Corp., returning to Union Carbide & Carbon in 1927, where he remained until 1929. He next became research engineer for the Simonds company, from which position he recently resigned to form his new connection.

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W. B. Coullie, general sales manager, Harbison-Walker Refractories Co., Pittsburgh, was elected president of the American Refractories institute at the annual meeting held in St. Louis, June 5. Other officers elected follow. First vice president, W. J. Westphalen, vice president, Laclede-Christy Clay Products Co., St. Louis; second vice president, A. P. Taylor, president, Charles Taylor Sons Co.,

Cincinnati; Treasurer, C. C. Edmunds, treasurer, McLain Fire Brick Co., Pittsburgh; secretary, Dorothy A. Texter, Pittsburgh.

The following directors also were elected: George A. Balz, president, Seaboard Refractories Co., Perth Amboy, N. J.; J. E. Lewis, president, Harbison-Walker Refractories Co., John R. Sproul, president, General Refractories Co., Philadelphia; A. P. Green, president, A. P. Green Fire Brick Co., Mexico, Mo.; J. D. Ramsay, president, North American Refractories Co., Cleveland; H. L. Tredennick, president, Haws Refractories Co., Johnstown, Pa.; J. H. Cavender, sales manager, North American Refractories Co.; A. P. Taylor, president, Charles Taylor Sons Co.; S. M. Kier, vice president of General Refractories Co.

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T. P. Jackson, identified with Diamond Chain & Mfg. Co., Indianapolis, since 1913, latterly as service manager, has assumed the duties of traffic manager. He succeeds the late Howard J. Mehl, whose death was noted in STEEL of June 18.

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Lester A. Blackford, of Montclair, N. J., who became affiliated with American Car & Foundry Co., St. Louis, in 1903, and who has been assistant treasurer since 1917, has been elected treasurer. He succeeds the late Stanley A. Mallette.

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Corliss E. Sullivan, chairman of the board, Central United National bank, Cleveland, was elected a director of Republic Steel Corp., Youngstown, O., at a meeting of the board of directors June 23, to fill a vacancy.

W. W. Hancock, secretary of the company, was also elected treasurer.

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Charles L. Bastian, formerly president, has been elected chairman of the board of the Bastian-Blessing Co., Chicago, oxyacetylene welding and cutting equipment. Lewis G. Blessing, formerly vice president and general manager, has been elected president, as noted in STEEL of June 11. Carl J. Palmer, formerly vice president of the Liquid Carbonic Corp., has been elected vice president and general manager. Edward N. Krein, formerly secretary, has been elected vice president in charge of production. Andrew C. Krein, treasurer, has been elected secretary and treasurer.

Obituaries

BARTLETT MURDOCK SHAW, 66, past president of the New England Foundrymen's association, died June 21 at Watertown, Mass. Born at Carver, Mass., he early became associated with the Walker-Pratt Mfg. Co., finally becoming superintendent and general manager. He served several years as chairman of the board of selectmen of Watertown, and was a member of numerous organizations.

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William H. Larimer, 50, treasurer and director of Armstrong Cork Co., Lancaster, Pa., died June 20 in that city. He formerly was engaged in the banking business in Pittsburgh, joining the Armstrong company about 11 years ago.

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Frank H. Banner, factory superintendent, General Railway Signal Co., Rochester, N. Y., for the past eight years, died May 22.

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W. M. Rynerson, 69, New York representative for the past 14 years of Carter Bloxonend Flooring Co., Kansas City, Mo., died recently in New York.

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Lloyd Johnson, 50, manufacturing director of Joubert & Goslin Machine Co., Birmingham, Ala., for many years, died recently. He was born in Brooklyn, N. Y.

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Louis R. McCleary, of Buffalo, manufacturers agent in that city for the Cleveland Switchboard Co., Cleveland, was killed in an automobile accident at West Bloomfield, N. J., June 12.

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John F. Fowler, 70, authority on export trade and former vice president of W. R. Grace & Co., New York, died June 15 at Rye, N. Y. He entered the employ of the Grace company in 1875.

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Albert T. Weaver, 65, for a number of years with the sales department, American Steel & Wire Co., Chicago, died June 21 at Chicago. When he left the Steel & Wire company ten years ago he was manager of the bale tie department.

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John C. V. Christensen, 49, design engineer since 1927 for the Cincinnati Union Terminal Co., Cincinnati, died June 16. He designed tunnel sections, retaining walls and highway bridges for the Detroit River Tunnel Co., Detroit, and was associated with various railroad projects, piers and passenger stations.

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Frederick C. Austin, 78 retired Chicago manufacturer, died recently in Pasadena, Calif. For a number of years he was associated with his uncle, H. W. Austin, pioneer Chicago hardware manufacturer. Mr. Austin organized the F. C. Austin Mfg. Co. in 1897 and the Austin Drainage & Excavating Co. in 1904. He retired from all business activities, however, about ten years ago.

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Samuel C. Coddington, founder of Lakeside Bridge & Steel Co., Milwaukee, and chairman of its board of directors, died June 13. He was born in Kansas City, Mo., in 1881 and went to Milwaukee at the age of 20 He organized the structural steel company in 1911. He also was president of the Coddington Engineering Co., general contractor, and was interested in other industries.

Electrical Engineers Name Skinner New President

Asheville, N. C.—Charles E. Skinner, assistant director of engineering, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has been elected president of the American Institute of Electrical Engineers for the year beginning Aug. 1, it was announced here June 22 during the annual summer convention of the institute

Vice presidents elected were: W. B. Kouwenhoven, associate professor, Johns Hopkins university, Baltimore; W. E. Freeman, head of department of electrical engineering, University of Kentucky, Lexington, Ky.; Paul H. Patton, telephone engineer, Northwestern Bell Telephone Co., Omaha, Nebr.; A. W. Copley, engineering manager, Pacific Coast division, Westinghouse Electric & Mfg. Co., San Francisco; and L. B. Chubbuck, engineer, Canadian Westinghouse Co. Ltd., Hamilton, Ont.

National Treasurer W. I. Slichter, professor of electrical engineering, Columbia university, New York, was re-elected.

Bolt and Nut Makers Plan New Association

Plans are actively under way for the organization of a new association of bolt and nut manufacturers. It is expected the plans will be perfected at a meeting scheduled some time in July, whereupon they will be submitted for approval by the government. George S. Case, chairman, Lamson & Sessions Co., Cleveland, is a leader in the movement.

Check Sales of Forgings

Washington—Total value of iron and steel forgings manufactured in 1929 was $156,249,000, of which three-fourths or $116,172,000 worth was sold to manufacturers . Of the remaining 25 per cent, approximately 17½ per cent was sold to railroads, public utilities and contractors, 6 per cent to wholesalers and 1½ per cent to manufacturers own wholesale branches.

Terne Standard Continued

Washington—The department of commerce has extended without change for six months the simplified practice recommendation on roofing ternes.

Here and There in Industry

ARTHUR G. McKEE & CO., Cleveland, engineers and contractors, are sending a party of ten engineers to Russia, leaving New York June 17, to assist in supervising the construction of a large iron and steel plant for the Soviet government at Magnitogorsk, in the Ural mountains, on the western edge of Siberia. This plant will be one of the largest in the world, located at the foot of a mountain containing millions of tons of iron ore. The contingent of McKee engineers forming the staff now in Russia is made up of the following: George Morgan, limestone erection plant; Niels Yde Anderson, chief designing engineer; Elmer C. Scoville, specification engineer; Robert L. Willis, design power engineer; Alexander A. Grabau, blast furnace engineer; John D. Campbell, carpenter foreman; Charles W. Springer, blast furnace erection specialist; Gaylord W. Gump, carpenter and concrete foreman blast furnace; R. A. Watson, mining engineer; J. A. Gabriel, water and canalization engineer.

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Marine Steel Corp. has moved its New York offices from the Chrysler building, 405 Lexington avenue, to 11 Broadway.

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Wheeling Steel Corp., Wheeling, W. Va., has established a branch office at 1522 Rand building, Buffalo, in charge of S. M. Hopkins.

□ □ □

Barnes Mfg. Co., Mansfield, O., has rented as a warehouse and distribution point for plumbing and heating supplies, 16,000 square feet in a 1-story building at Pershing road and Wallace street, Chicago.

□ □ □

Fireless Locomotive Corp., Corry, Pa., is completing its financing and is about ready to begin production. It will start its activities in the plant of the Climax Mfg. Co., Corry. Harvey LeFevre is in charge of operations.

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Longview Iron Works, Longview, Tex., Guy McKay owner, has leased its plant to C. Carlisle Machine Works, Port Arthur, Tex., which is operating it under the old name. A specialty of oil field work is being followed.

□ □ □

American Brown Boveri Electric Corp., New York, has approved through its stockholders, sale of the assets of its electric subsidiaries to the Allis-Chalmers Mfg. Co., Milwaukee, for $600,000 and 62,000 shares of stock of the latter. The name will be changed to New York Shipbuilding Co.

□ □ □

Meriam Co., Cleveland, manufacturer of flow meters, has appointed Anderson Engineering Co., 42 Church street, New Haven, Conn.; Leonard Maleson Co., 815 Locust street, Philadelphia; S. S. Shook Co., 528 Duquesne Way, Pittsburgh, exclusive representatives in their several territories.

□ □ □

J. J. Ryan & Co., 104 South Jefferson street, Chicago, brass castings and plumbers' brass specialties, have moved their plant to a 1-story manufacturing building at 4301-05 West Kenzie street which has been leased for a term of years. The Ryan company, which has been in business since 1881, has been at the Jefferson street location for 28 years.

□ □ □

Monarch Machinery Co., 300 North Third street, Philadelphia, is being liquidated through executors' sale of its real estate and machine tools, in settling the estate of the late Edwin R. Mack. An auction will be held June 29 by Samuel T. Freeman & Co. and the tools will be sold in separate lots only. All tools have been reconditioned and each is on skids ready for shipment.

□ □ □

Lukenweld Inc., a division of the Lukens Steel Co., Coatesville, Pa., has appointed W. R. McDonough & Co., National building, Cleveland, and Dravo Doyle Co., Pittsburgh, its representative in these districts. Lukenweld Inc. is engaged in the design and manufacture of parts of machinery and equipment by gas-cutting, forming and welding of rolled steel for use as housings, frames, bases, beds, gear cases and other machinery and equipment parts.

□ □ □

Hilton Steel Co., engineer and fabricator, has been formed at Warren, O., and has placed in operation a plant for general plate and sheet fabricating. Jack L. Hilton is president and treasurer. He formerly was manager of the contractors' equipment division of the Commercial Shearing & Stamping Co., Youngstown, O., and general superintendent of the Heltzel Steel Form & Iron Co., Warren, O. R. A. Zeyfang, formerly assistant shop superintendent of the Dalzell Bros. Co., Youngstown, O., and estimator of the plate department of the Commercial Shearing & Stamping Co., is vice president in charge of production. A. F. Steele, formerly accountant for the Brainard Steel Corp., Warren, O., is secretary.

□ □ □

Globe Iron Co., Jackson, O., has named Eaton, Rhodes & Co., Cincinnati, exclusive agents in parts of Ohio and Indiana.

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Wheeling Steel Corp., Wheeling, W. Va., has ordered from the Freyn Engineering Co., Chicago, ten Freyn-design electric roll heaters and two automatic heat regulating controls for the sheet mills being rebuilt at the Beech Bottom works, Beech Bottom, W. Va. Tokuyama Sheet Steel Co., Tokuyama, Japan, has bought two additional heaters for its mills. French and German associates of the Freyn company have sold seven heaters recently. This makes a total of 330 of these heaters in service in sheet mills. Mitsubishi Iron & Steel Co., Japan, has bought from the Freyn company three pressure burners for hot blast stoves for a furnace in Manchuria. Guest, Keen, Baldwins Ltd., Cardiff, Wales, has bought a Freyn-design stockline recorder, making 65 of these recorders now in service.

Financial News of Steel Industry

CAMPBELL, WYANT & CANNON FOUNDRY CO., Muskegon, Mich., net earnings for the first six months of 1931 will cover the dividend requirement of 50 cents a share.

□ □ □

Arthur G. McKee & Co., Cleveland, June 11 declared the two remaining 1931 quarterly dividends of 37½ cents a share on class B stock, officials stating that earnings to date cover the dividend requirements.

□ □ □

Truscon Steel Co., Youngstown, O., has halved its dividend rate on common stock, declaring quarterly dividends of 15 cents each payable July 15 and Oct. 15. The preferred dividend of $1.75 quarterly, next payable Sept. 1, was maintained.

□ □ □

Midland Steel Products Co., Cleveland, has declared the regular dividend of $2 on its 8 per cent cumulative first preferred, 50 cents on the $2 noncumulative preferred, and 75 cents on the common, all payable July 1.

MIRRORS of MOTORDOM

DETROIT

GREATER comfort and roadability, attained by what might be termed new uses of steel, are featured in the new series of Packard and Plymouth, now being introduced.

By means of cables leading from a control on the dash, three adjustments are possible in the Packard shock absorbers. For city asphalt, for country gravel and for the execrable "washboards" of stone roads the proper tension to facilitate comfort can be readily provided. The taut adjustment is designed to improve roadability at high speeds.

Among other things, the new Packard models have a distinctly lower center of gravity, extreme quiet is sought by a generous use of rubber mountings and insulation, the windshield is slanting and without a visor, and in general the body is streamlined more than any previous Packard.

The traditional Packard radiator line can be easily distinguished, although a conservative V-type radiator has been adopted and the bail is eliminated from the radiator cap. All models are powered with straight eights.

Mount Motor on Springs

Plymouth will attempt to capitalize what it describes as a "vibrationless" motor. Largely by means of steel springs, the more powerful four-cylinder motor will be cradled; it will virtually float, and the transmission of vibration to the body and frame will be practically eliminated, it is claimed.

This is not wholly unlike the motor suspension once employed in the Maxwell. It will be recalled that Chrysler purchased Maxwell and Chalmers in first bringing out the Chrysler line.

Plymouth will be the first of the Chrysler group to offer selective free wheeling; Dodge and other members of the group probably will follow. It is not true that with the new Plymouth, Chrysler will invade the low price field in which Ford and Chevrolet are dominant—Plymouth always has been priced in this class—but Plymouth is being modernized and refurbished to be more competitive.

Chrysler is understood to have developed a new type of transmission, the effect of which is practically to eliminate the use of the clutch. This is said to be revolutionary to the point of making Chrysler common stock an attractive speculation.

Make Dies for 1932 Jobs

Die and toolmakers, always some months in advance of new models, are beginning to display signs of activity in anticipation of changes for the January, 1932, shows, even though many manufacturers for reasons of economy will attempt to hold down development costs.

Fisher Body has called back a number of employes of its die and tool departments to prepare for changes in General Motors bodies. A complete revision of the Buick body is understood to be in prospect.

This month marks two years that the present Buick body has been in production with only minor variations. This period covers the last year of the six and the first year of the eight. Since Buick is not to bring out its 1932 series until late this year, it will have been using substantially the same body for two and one-half years—probably a record for the automobile industry.

Some changes are also being undertaken in Cadillac bodies. Fisher Body, incidentally, is concentrating its purchases at Detroit, permitting only emergency purchases to be made at its outlying plants. Fisher Body last week sold 2500 tons of dies, in line with its policy of preserving dies only for five years.

So-called shatter proof or safety glass for Fisher Bodies will probably be a result of the alignment of General Motors with the Libby-Owens-Ford Glass Co., Toledo, O. This company is to take over the National Plate Glass Co., Ottawa, Ill., subsidiary of Fisher Body, and in return takes back a $50,000,000 contract covering Fisher Body glass requirements for 7 years.

Briggs Body has curtailed its production of Ford bodies but has taken on 5000 men for the new Plymouth job. Murray Body also has felt the pinch of declining Ford requirements. Studebaker is having die and tool work done for its 1932 job.

Ford continues an enigma, even to Ford officials. It is more true than ever one Ford department does not know what the other is doing. There is a growing belief that the eight-cylinder job which was to be offered this year has been postponed, partly to permit more motor research. Or, as some say, it may be a repetition of the situation in 1926 and 1927 when Ford pushed Model T until the market for it vanished.

New Wheel for Ford

But something new unquestionably is in the air at Fordson. In the motor building one side has been cleared, presumably for a new assembly line. Within other departments small structures to house and guard development work have been erected.

Some parts makers are producing against specifications patently not for the current Model A. An entire new wheel for Ford now is in production; it will be recalled that Ford engineers have been attempting to design a lighter wheel in order to lessen unsprung weight, and in this connection a hub that would also serve as a

(*Concluded on Page 77*)

EDITORIAL

The Wire Industry Tells Its Story

ACTIVITIES of the Wire association in connection with the annual meeting and exhibition of the Association of Iron and Steel Electrical Engineers, held last week in Cleveland, attracted attention to an important branch of the steel industry whose achievements sometimes are overlooked. No one who followed the program of the Wire association or who examined the exhibits of equipment for wire could fail to be impressed with the extent to which wire has contributed to the advance of civilization.

Speaking on the subject, "History of the Wire Industry," Kenneth B. Lewis unfolded to his listeners a broad panorama of many years of development in the making of wire. The painfully slow progress at the start, the curious manner in which trivial accidents led to important discoveries, the remarkable advances which occurred in the nineteenth century and finally the important refinements—especially in rolling, drawing, finishing and treating equipment—which have characterized the past quarter-century showed that the history of wire-making comprises a series of unusually dramatic episodes.

Importance of Wire To Industry and To Public Is Emphasized

The address by Mr. Lewis proved to be an appropriate introduction for the technical papers which followed. Heat treating, annealing, galvanizing, rust protection, lubrication, wire mill management, cost accounting and many other subjects were discussed. Motion pictures showing the manufacture of wire and wire products and also numerous important applications were exhibited. These features of the program, together with the demonstration of wire equipment at the show were designed primarily for the attention of executives, engineers and others identified with the wire industry.

To the credit of the Wire association, it should be reported that its officers did not overlook the opportunity presented by this meeting to acquaint laymen with the importance of wire. It arranged with a national radio service to broadcast the address of William A. Bennett on "Wire in Everyday Life."

Mr. Bennett traced the movements of a typical city resident from the time he arose in the morning until he retired at night, losing no opportunity to show how almost every act throughout the day was dependent upon articles, equipment or services made possible by wire. So carefully were the details of this sketch worked out and so effectively did Mr. Bennett deliver it that the radio audience—including thousands who probably never heard of the wire industry—have an entirely new conception of what wire means in terms of everyday convenience and comfort. Numerous laymen who have little or no interest in industry have remarked that this radio talk made them realize the close relationship between industry and the public.

Past Record Is Good; Future Depends on Cultivating Markets

It is good business for the producers of any product to acquaint the world with what their industry is doing. Perhaps on the whole the wire industry in the past has been reluctant to put its best foot forward. Its achievements have not been heralded as vigorously as those of certain other branches of the steel industry.

This attitude of reticence is surprising in view of the record of wire. About 50 works in 15 states are engaged in rolling wire rods. The number of companies drawing, finishing and shaping the finished material into commercial products runs into the thousands. Also the penetration of wire products into the various manufacturing industries is almost on a par with the versatile bars and sheets.

Production, which is measured most conveniently through the statistics on wire rods, mounted steadily from a few hundred thousand tons annually in the eighties to a wartime peak of 3,518,746 tons in 1916. The best years since that time were 1917, 1920, 1923, 1928 and 1929. In these five years the annual production exceeded 3,000,000 tons but fell short of the 1916 record. The highest output in recent years was 3,134,409 tons in 1929.

With improved facilities now available in many of the wire plants and with capacity more than sufficient for any reasonable demand, it would seem that the wire industry should be devoting an increasing amount of attention to markets.

If the recent activities of the Wire association furnish a reliable criterion, the wire producers now are more alert to new opportunities than at any time since the war. We suggest that in market analysis will be found a fertile field for cultivation.

THE INDUSTRIAL DIAL

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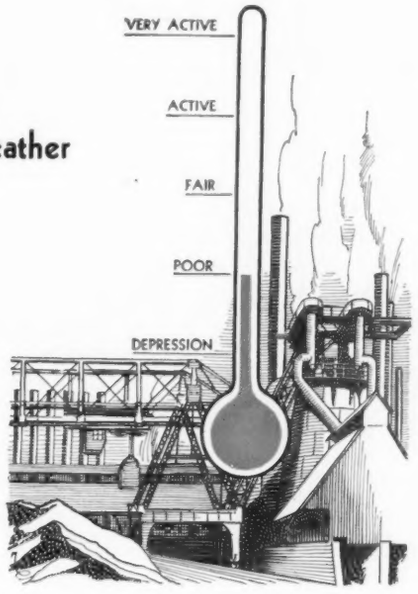
SOMETIME in the future, when the present depression can be reviewed in retrospect, it may be said that May, 1931, was the month in which business men ceased to rely on hope and got down to the real work of making a good showing in spite of discouraging conditions. More common-sense planning for economies and greater determination to face the situation and conquer it were evident in the fifth month than in any similar period during the entire span of the depression. In May the spirit of work definitely supplanted the attitude of watchful waiting. With this change in the mental outlook of business there developed a healthier sentiment which is withstanding the shock of dismal business news.

Industrial Weather



TREND:

Unsettled

Activity

As expected, the production of steel ingots and pig iron was lower in May than in April. The rate of steelworks operations, which reached a peak of 57 per cent in March, was about 41 per cent at the end of May and has since dropped to around 38. With a net loss of 8 blast furnaces in blast on May 31, a lower output of iron in June is indicated.

Price

Commodity prices lost ground steadily in May. Bradstreets' index, which stood at $8.91 on May 1 slumped to $8.64 on June 1, due to weakness in prices of commodities in almost every group.

Where Business Stands

Monthly Average, 1930—100

	May, 1931	April, 1931	May, 1930
Steel Ingot Output	75.5	82.1	115.7
Pig Iron Production	74.7	77.7	121.4
Freight Movement	82.8	82.6	104.5
Building Construction	91.5	92.8	126.0
Automobile Output	115.6	120.6	152.1
Wholesale Prices	80.3	82.9	100.2

STEEL'S composite of steel and iron prices, which averaged $31.59 in April, fell to an average of $31.37 for May, and has since dropped to $31.03. No signs of a halt in the decline were apparent in May, although late in June greater stiffness in steel and nonferrous metal prices was evidenced.

Demand

Steel requirements were at low ebb in May. Building awards were almost on a par with April totals, freight car awards were practically negligible, steel exports were still subnormal and while automobile production held up remarkably well in May, the builders did not take much steel, having overestimated their requirements earlier in the year. In none of the four principal outlets for steel—automobile, building, railroads and oil, water and gas projects—is the prospect for marked increase in tonnage imminent. A dull summer is indicated.

Business Trend Charts of the Month

Production

Steel ingot production ..... June 11, p.27
Pig iron production ..... June 11, p.28
Blast furnace production rate ..... June 11, p.29
Coke output ..... June 25, p.29

Demand

Unfilled orders, U. S. Steel Corp. ..... June 18, p.35
Railroad car orders ..... June 18, p.38
Index of machine tool orders ..... June 18, p.37
Building construction ..... June 18, p.36
Steel castings ..... June 4, p.36
Structural steel sales ..... June 4, p.38
Steel sheets ..... June 4, p.37; June 25, p.29
Foundry equipment orders ..... June 25, p.30
Automobile output ..... June 4, p.37

Prices

Bradstreet's index ..... June 11, p.28
Iron and steel price index ..... June 4, p.35
Basic iron—heavy melting steel ..... June 4, p.36

Miscellaneous

Foreign trade ..... June 25, p.30
Freight traffic ..... June 18, p.36
Commercial failures ..... June 18, p.37
Refined copper ..... June 18, p.38
Railroad earnings ..... June 11, p.29
Iron and steel foreign trade ..... June 4, p.38

Thumb Nail Sketches of Business

Blast Furnace Activity

From a low point in December, 1930, output of pig iron recovered moderately during the first four months of 1931, and in May dropped back to a point midway between February and March totals. In percentage of operation the recovery was from 38.1 per cent in December to 46.5 in April. In May the rate dropped to 44.7 per cent. A net loss of 8 stacks was registered, leaving a total of 105 active furnaces on May 31. During the first five months of 1931 production was 38 per cent behind the output during the corresponding period last year.

Business Failures

Commercial failures in May numbered 2,248, according to R. G. Dun & Co. Liabilities were $53,371,212—slightly less than in May last year. The reduction in the number of insolvencies from the high peak in January has far exceeded the usual seasonal improvement in the spring months.

Employment Unchanged in May

Industrial employment in May showed only negligible changes from April levels, according to the various barometers. The *Annalist* index of factory employment was 79.1 for May, compared with 79.0 for April. Industrial payrolls were at 70.7 for May as against 71.4 in April. Non-industrial employment attending the summer months may have relieved unemployment somewhat beyond the picture presented by statistics. However the problem of the unemployed still is acute.

Corporation Earnings Down Sharply

According to the compilations by Ernst & Ernst from published reports of corporation earnings, the profits of 689 companies for the first quarter of 1931 were 37.03 per cent less than in the same quarter last year. Of these, 313 industrial companies reported profits averaging 58.8 per cent less. Among the more important industrial groups are the following:

NET PROFITS—FIRST QUARTER

	1931	1930	Per Cent Decrease
Aeronautics	$ 661,823	$ 231,221	186.2*
Auto. manufacturers	27,864,130	54,018,512	48.4
Auto parts, access.	4,141,019	13,070,456	68.3
Building supplies	1,996,354	5,178,473	61.4
Chemicals	21,454,595	30,427,160	29.5
Coal mining	1,150,814	504,397	128.2
Elect. household equipment	1,020,565	1,574,383	35.2
Iron and steel	5,041,793	59,430,886	91.5
Machinery and tools	8,801,227	25,715,524	65.8
Mining and smelting	2,867,647	13,430,927	78.6
Oil producing, refin.	7,425,515†	24,775,935	129.9
Railroad equipment	3,677,515	8,144,692	54.8
Total industrials	$136,196,131	$330,862,834	58.8

*Increase. †Deficit.

For 171 railroads the net operating income was 39.3 per cent less, for 100 public utilities profits were 4.4 per cent less and for 105 telephone companies operating income was 2.1 per cent less.

The Barometer of Business

Industrial Indicators

	May, 1931	April, 1931	May, 1930
Pig iron output (Daily average, tons)	64,355	66,986	104,564
Machine Tool Index	102.1	103.3	165.1
Unfilled orders (tons)	3,620,452	3,897,729	4,059,227
Ingot output (Daily average, tons)	96,365	104,711	147,515
Dodge Bldg., awards in 37 states (sq. ft.)	38,940,800	39,380,300	53,732,000
Automobile output	338,307*	352,867	444,699
Coal output, tons	28,333,000	28,478,000	35,954,000
Business failures; number	2,248	2,386	2,179
Business failures; liabilities	$53,371,212	$50,868,135	$55,541,462
Cement production, Bbls.	14,006,000	11,245,000	17,249,000
Cotton consumption, bales	465,770	508,744	473,917
Car loadings (weekly average)	747,296	746,417	918,764

*Estimated.

Foreign Trade

	May, 1931	April, 1931	May, 1930
Exports	$205,000,000	$217,000,000	$385,013,000
Imports	$182,000,000	$187,000,000	$284,644,000
Gold exports	$628,000	$27,000	$82,000
Gold imports	$50,258,000	$49,543,000	$23,552,000

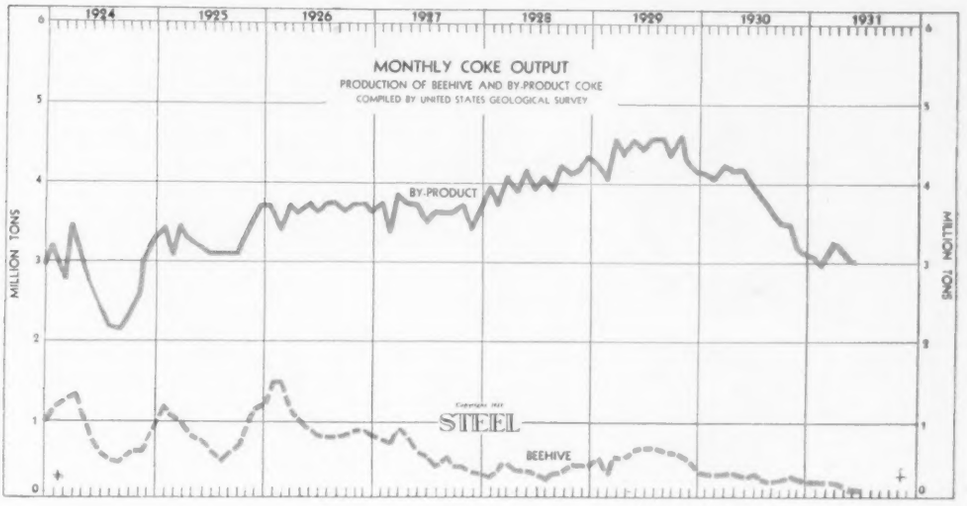
Financial Indicators

	May, 1931	April, 1931	May, 1930
25 Industrial stocks	$199.46	$218.88	$324.95
25 Rail stocks	$68.69	$75.87	$123.54
40 Bonds	$83.19	$83.57	$88.09
Bank clearings (000 omitted)	$36,795,631	$39,423,686	$31,428,918
Commercial paper rate (N. Y., per cent)	2-2½	2¼-2½	3½-4
*Commercial loans (000 omitted)	$7,885,000	$8,001,000	$8,402,000
Federal Reserve ratio, per cent	85.3	84.0	83.2
Railroad earnings**	$39,074,311	$45,905,754	$62,652,307
Stock sales, N. Y. stock exchange	46,663,292	54,333,243	78,040,030
Bond sales, par value	$241,287,800	$223,968,000	$221,488,200

*Leading member banks Federal Reserve System.
**April, March and April, respectively.

Commodity Prices

	May, 1931	April, 1931	May, 1930	Monthly average, 1913
STEEL's composite average of 14 iron and steel prices	$31.37	$31.59	$33.73	$26.32
Bradstreet's index	$8.64	$8.91	$10.77	100
Wheat, cash (bushel)	95c	97c	$1.04	92c
Corn, cash (bushel)	78c	77c	96c	51c
Petroleum, crude (Bbl.)	57c	57c	$1.18	$2.50



By-Product

	Tons
May, 1931	3,125,571
April, 1931	3,146,490
May, 1930	4,265,528

Beehive

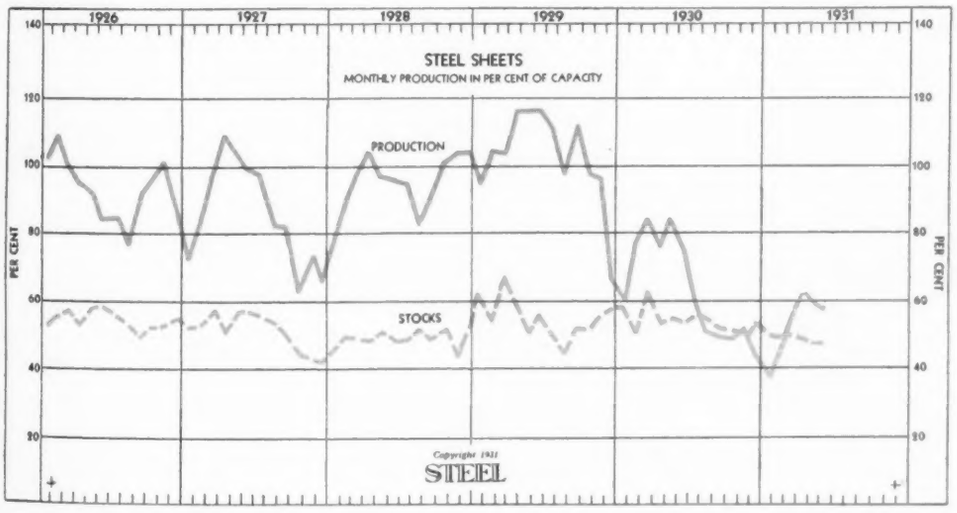
May, 1931	93,900
April, 1931	108,600
May, 1930	272,000

Beehive Coke Production Touches New Low, By-Product Is Down 3.9 Per Cent

Production of by-product and beehive coke turned downward in May, the total output of both amounting to 3,219,471 tons, down 1,318,000 tons from May, 1930. Stocks increased to 3,062,151 tons, against 2,280,542 tons last year. By-product output was at the daily rate of 100,825 tons in May, compared with 104,883 tons in April, a drop of 3.9 per cent. The decrease at furnace plants was 4.7 per cent and at merchant plants 2.2 per cent. Eighty-eight plants were in operation, producing at the rate of approximately 60 per cent. Beehive coke production dropped again, to 93,900 tons, the lowest in any month since the early days of the industry. A year ago beehive output was 272,000 tons.

May Output of Independent Sheet Producers Takes Seasonal Trend Downward

Sheet steel output of independent producers was cut slightly in May, to 201,846 tons, compared with 213,608 tons in April and 274,220 tons in May a year ago. The downward trend was a seasonal movement accompanying a marked drop in sales, which totaled 148,612 tons compared with 191,987 tons in April and 204,589 tons in May, 1930. May shipments were curtailed and went under production to reach 191,942 tons. Despite this excess of production, stocks were down to 169,444 tons, or to 47.5 per cent of capacity. Stocks awaiting shipment and unsold stocks were down fractionally. Unfilled orders were off from 88.5 to 83.2 per cent of capacity, or 296,731 tons.

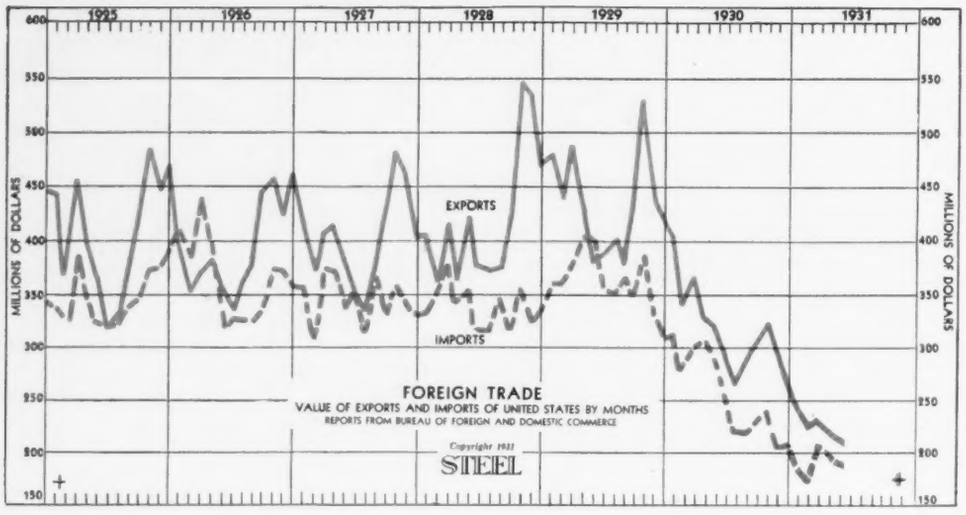


Production
Per cent of capacity

	1931	1930
May	56.6	73.3
April	58.2	84.0
March	61.1	73.7
February	57.2	83.9

Stocks
Per cent of capacity

	1931	1930
May	47.5	54.7
April	48.1	56.6
March	51.7	54.6
February	54.1	61.4



EXPORTS

May, 1931	$205,000,000
April, 1931	217,000,000
May, 1930	319,592,000

IMPORTS

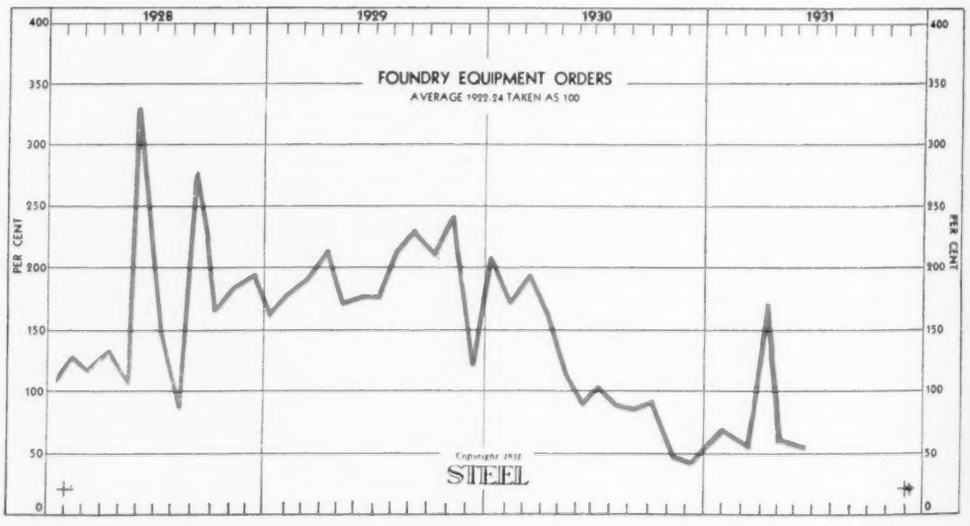
May, 1931	$182,000,000
April, 1931	187,000,000
May, 1930	284,644,000

Export Value Is Lowest For Any Month Since October, 1914

The United States' export trade in May fell off to the lowest point since October, 1914 as for the second successive month both exports and imports crept downward. Exports were valued at $205,000,000 and imports at $182,000,000, leaving a trade balance of only $23,000,000. A month ago exports were $217,000,000 and imports $187,000,000. A year ago exports amounted to $319,592,000 and imports to $284,644,000. The five-month total for 1931 exports was $1,129,767,000, a decline of nearly 40 per cent from 1930, when in five months merchandise worth $1,780,634,000 was shipped. Imports in five months of this year were valued at $936,028,000, a drop of about 35 per cent.

Orders for Foundry Equipment Fall Off To New Low for 1931

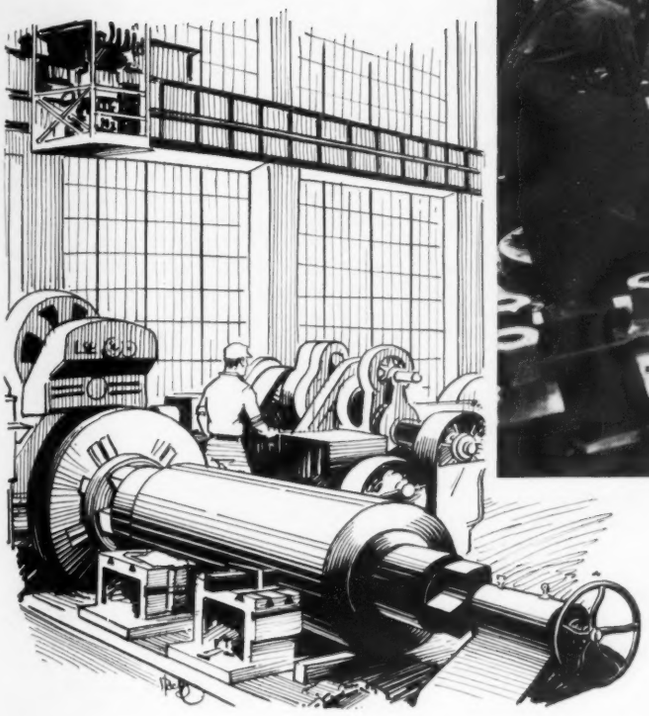
A moderate decline in foundry equipment orders reported to the Foundry Equipment Manufacturers association resulted in the lowest index of gross orders for the year to date. The May index was 54.1, a decline of 3.6 points from April. In May a year ago the index was at 92.7, after declining from 122.8 in the previous month. The three months' moving average of gross orders dropped only a fraction of a point in May to 95.4. Shipments, with an index which jumped from 69.7 to 118.6, were at the highest level since June, 1930. Consequently the unfilled orders indicator slumped from 180.07 to 123.8. A year ago unfilled orders were in the midst of a five-month recession at 179.3.

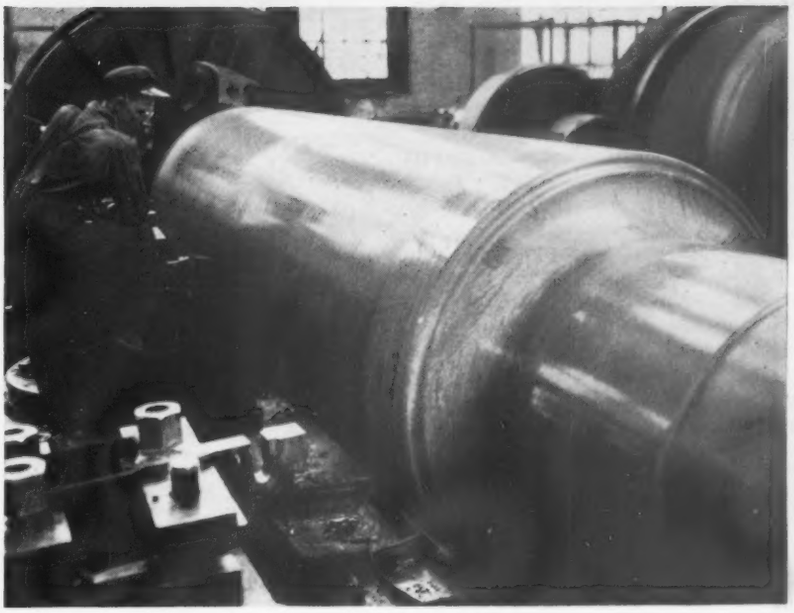


Per Cent

	1931	1930
May	54.1	92.7
April	57.7	122.8
March	174.4	164.1
February	54.7	196.4
January	65.3	160.1

	1930	1929
December	59.8	208.0





ROLL turning shops are important users of tool steel for roughing and finishing cuts on rolls. High-speed steel and tungsten finishing steel tools are used chiefly for this work

Tool Steel Analyses and Applications

Part I

BY W. H. WILLS
Chief Metallurgist, Ludlum Steel Co.

TOOL steel comprises but a small part of national production of steel and this ratio always will be low, particularly in view of the fact that the tendency of industry in general is to expect and to get better production from tool steel. This naturally follows from improvements in heat treating methods and to some extent from the development of new analyses, better suited to the work.

The number of tool steel brands now on the market is up in the hundreds and many are comparatively new, for it has not been so many years since straight carbon and air hardening tungsten steel were about the only grades produced. However, the development of electric melting, improvement in the quality of ferroalloys, and the expansion of industrial requirements have been responsible for the numerous brands now available.

Six divisions or types of tool steels may be classified as follows: Water hardening (carbon and carbon-vanadium) steels; oil hardening (manganese, and high-carbon high-chrome) steels; low-tungsten finishing steels; alloy shock resisting steels; hot die steels; and high-speed steels. The water hardening steels except in small sections harden with a tough core and develop a high degree of hardness and toughness. The hardness falls off with fairly low drawing temperatures.

Usual chemical specifications for straight carbon tool steel call for ten point carbon ranges such as 0.80 to 0.90 per cent, or 0.95 to 1.05. It is often furnished as low as 0.70 carbon and sometimes as high as 1.40 or more. Typical limits on the other elements are: Manganese, 0.20 to 0.30; phosphorus and sulphur, 0.020 maximum; silicon, 0.15 to 0.30; and chromium, 0.10 maximum. In the case of the carbon-vanadium steels the carbon ranges 0.80 to 0.90 and 1.00 to 1.10 are most common and the vanadium range 0.20 to 0.30, with other elements similar to carbon tool steel.

The oil hardening steels are deep hardening, though perhaps not so much so as high-speed steel. The manganese type does not develop as high a degree of hardness as the high-carbon high-chrome, and both show a comparatively low impact value. As to nondeforming qualities there is little difference, assuming

proper heat treatment. The high-carbon high-chrome steels are unequaled for resistance to wear and abrasion. They are, however, not as easy to machine as the manganese oil hardening type.

Manganese oil hardening steels generally are made to carbon range such as 0.80 to 0.90 per cent. Manganese in some instances is as low as 1.00 per cent and again as high as 1.50 or more. Small amounts of other alloys are often included such as chromium, tungsten, vanadium, or molybdenum.

The high-carbon high-chrome steels run from as low as 1.50 carbon to as high as 2.50 with chromium around 11 or 12 per cent. They also may carry a small content of other alloys such as molybdenum, vanadium, cobalt or nickel.

Tungsten Finishing Steels

The low-tungsten finishing steels may be either oil or water hardening. They develop a high degree of hardness particularly with water quenching and are fairly deep hardening. Resistance to shock is low. One of their most important properties is ability to hold a keen cutting edge.

Tungsten finishing steels carry a carbon content around 1.25 to 1.40 per cent and tungsten from about 2.00 to as high as 4.00 or more. A small percentage of chromium or vanadium is sometimes included.

A large number of brands come under the heading of alloy shock resisting steels and the analyses vary widely. Perhaps the most common is the tungsten-chrome type with carbon approximately 0.50 per cent, tungsten 1.00 to 2.50, chrome 0.50 to 1.50, and often a small vanadium content. Another that has given good results is the silico-manganese punch steel with carbon about 0.50 per cent, manganese 0.70 to 0.80 and silicon 1.50 to 2.50. Silico-molybdenum, chrome-vanadium and nickel steels are other varieties. They may be oil or water hardening and the principal characteristics

INDUSTRIAL users of tool steel will be interested in the accompanying remarks on the various classifications and analyses of tool steel, together with a discussion of the many applications of the material and points to be watched in obtaining best results from tools of these special steels. The article is the first of two installments, the second to appear in an early issue of STEEL. The author, W. H. Wills, is chief metallurgist, Ludlum Steel Co., Dunkirk, N. Y., and presented the paper recently before the Worcester, Mass., chapter of the American Society for Steel Treating.

are high impact value along with moderate hardness.

Hot die steels include the 3½ to 4 per cent chrome and the tungsten-chrome types. They are characterized by the ability to retain a fair degree of hardness at elevated temperatures so as to resist wear and show resistance to shock and heat checking. They are deep hardening but develop a moderate degree of hardness. The chrome type appears to stand water cooling in service better than the tungsten. However, for severe jobs where the die parts attain a fairly high temperature and cooling is by air or oil, the tungsten type is better.

High-speed steels comprise a familiar group, by far the greater part of which produced at the present time is of the 12:4:1 tungsten-chrome-vanadium type, and the popular carbon ranges are between 0.65 and 0.75 per cent. High-speed steel develops a high degree of hardness and its outstanding property is the high degree of hardness maintained up to temperatures approaching a red heat.

Other high-speed analyses include the 14:4:2 type, which is a general purpose high-speed steel; and a similar specification with lower chrome and vanadium which finds some use for taps and reamers, having the advantage of lower hardening temperature with less distortion after treatment. There is also an analysis with carbon about 0.80 per cent, tungsten and chrome normal, vanadium about 2.00 and molybdenum 0.50, which gives good results on production cutting where not subject to shock.

Finally there are the cobalt high-speed steels which stand up well on certain heavy-duty jobs, such as iron and steel castings where hard spots, scale, and sand are apt to be encountered. They are recommended also for heat treated alloy steel, alloy iron rolls, and roughing cuts on chill iron. The cobalt content seems to aid in maintaining a cutting edge at or near a red heat and improve wearing quality. One thing should be kept in mind, however; that is, that the cobalt steels harden with a soft skin so that their use is limited to tools that can be ground all over after treating. Most of these carry 3 to 5 per cent cobalt. However, a recent development with several concerns is an analysis carrying 6 to 8 per cent cobalt with increased vanadium content.

Tungsten Carbide Tools

At this point mention is fitting of tungsten carbide, a comparatively new product of several of the tool steel mills. It is not considered as a steel but rather a compound, and its introduction has brought about a great advance in production standards for certain classes of work, in some places displacing high-speed steel. For general purposes it has not been found economical and in a sense it may be considered a competitor of the special high-speed steels. Its principal disadvantages are its brittleness and high initial cost. Also it cannot be forged and any alteration of shape after sintering must be by grinding.

Having a general idea of these six classes of tool steel, consideration can be given to some of the more important lines of industry in which tool steel is used. Users of tool steel can be divided into two groups—those who use it for tools made up by themselves for their own production, and those whose raw material is tool steel which goes into

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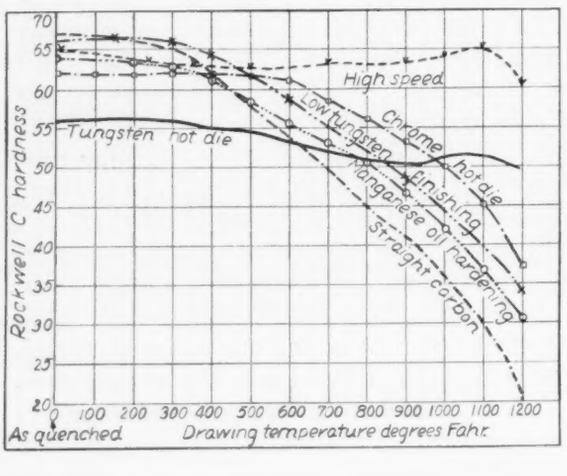

CURVES showing variation in Rockwell hardness of six types of tool steel with increasing drawing temperature

High-Speed Steel Mill Drives Require Better Lubricants

BY RALPH C. WALTER
Pennsylvania Lubricating Co.

ROLLING mill drives require lubrication not only for the bearings in which the shafts carrying the gears rotate but also for the protection and lubrication of the gear teeth and progress in the design and manufacture of gear drives requires lubrication practice to keep pace with it. Lubricants for gears and bearings for rolling mill drives until recently have shown no radical change. High-grade mineral oils for bearing lubrication have been available for many years and accepted practice adopted the use of such a low figure for bearing pressures that almost any high-grade filtered mineral oil gave satisfactory bearing lubrication.

As speeds increased it was necessary only to provide an oil circulating system to furnish a constant circulation of oil to carry off the heat generated. A cooling and filtering system generally was added to recondition the oil and eliminate the necessity of frequent renewal which practice of bearing lubrication is in general use at the present time in gear reduction units and gear sets although much less generally used on pinion stands.

The antifriction bearing is finding some favor with various heavy machinery builders but their use does not materially affect the lubrication problem as far as general discussion is concerned.

Sprayed with Water

Cast gears and pinions, many of which are still in service, generally operate openly without housings and in case of pinion stands are sprayed with water to carry off the frictional heat generated. As it is necessary to use some form of protective coating on the teeth to prevent metal to metal contact and excessive wear, various types of "gear shield" lubricants have been developed. To meet operating requirements this type lubricant must be sufficiently adhesive to stick to the teeth. It must have, also, sufficient body to maintain a protective film on the teeth under operating pressures and must be impervious to water. The few "gear shields," which successfully meet these requirements, are responsible for the excellent operation of many of the cast-gear mill drives.

The advent of the cut gear and pinion with their greater accuracy and higher cost required a more certain and better protection for their teeth. Two general practices were developed to accomplish this purpose, first, a circulating system in which the lubricant was sprayed on the teeth and, second, the maintenance of a level of lubricant in the housing into which the teeth dipped. The same general types of "gear shields" were used as with the open cast gears but in a lighter density to meet the circulating or splash conditions. It readily can be understood that such lubricants, on account of their high viscosity and adhesive nature, are unsuitable for bearing lubrication. As a result the general practice has been to equip gear units and pinion stands with separate lubricating systems for the bearings and gear teeth. The mill drives shown in Figs. 1, 2 and 3 are designed for separate lubrication for bearings and teeth.

With such practice there always has been great difficulty in isolating

STEEL mill operating departments have been faced with problems of lubrication since the application of the latest design pinion stands, gear sets and reduction gears to high-speed rolling practice. Progress made in solving these problems is related in the accompanying article. The author, Ralph C. Walter, is Chicago district manager, Pennsylvania Lubricating Co., Pittsburgh.

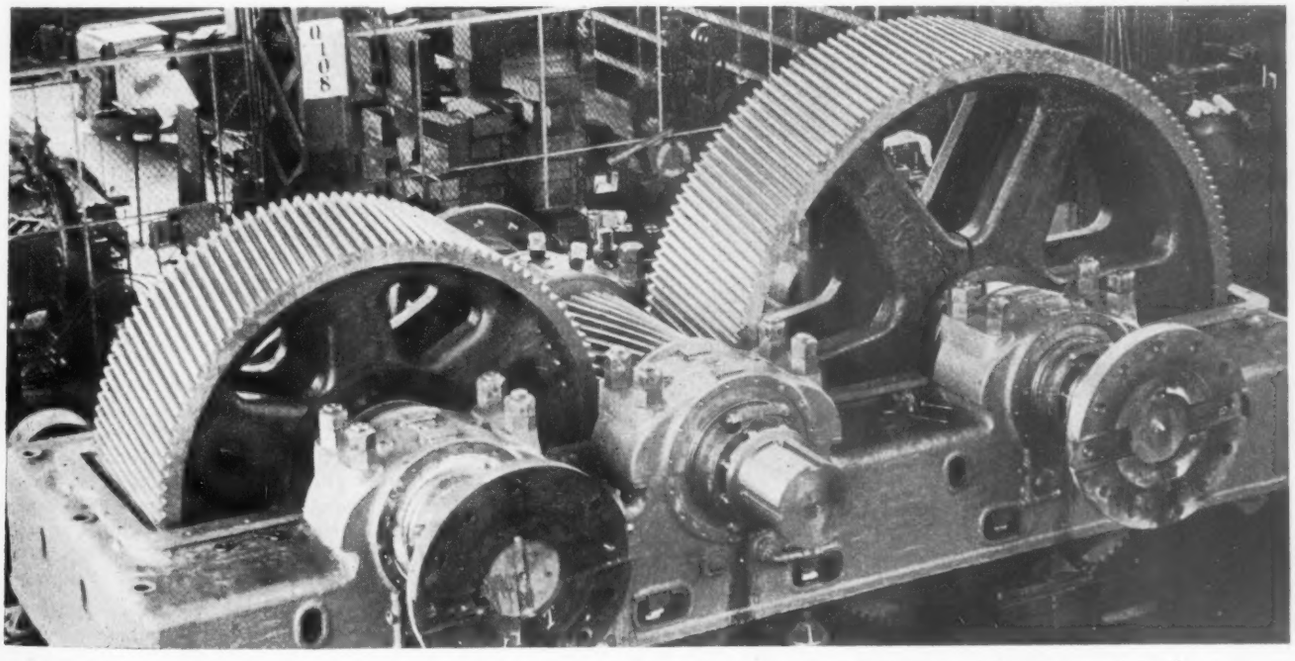

Fig. 1—Three-train drive of 6300 horsepower designed for separate lubrication of bearings and teeth

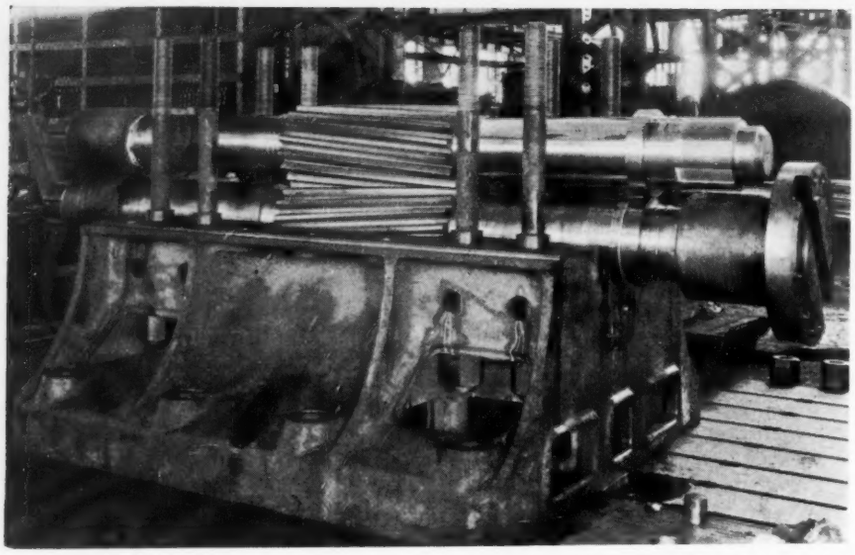

Fig. 2—Base plate and upper pinion assembled in pinion stand

the two systems and preventing contamination which destroys the efficiency of the lubricants. A combination of the two and the use of a single product for both bearing lubrication and gear teeth protection would be much simpler but attempts to work out this method have led to an undesirable compromise inasmuch as until recently no single product seemed to have the necessary qualities to meet all conditions, it being necessary to sacrifice the gear protection qualities of the lubricant to avoid excessive heating of the bearings. This particularly has been true in rolling mill service where the equipment is subjected to severe load conditions.

A few examples of successful operation of single lubricating systems on reduction units and gear sets are to be found in rolling mill service but in these few cases the loads are light and the gears oversize for the service required. Another exception is the pinion stands for blooming, slab, plate and similar large mill drives where the bearing size, clearance and speed permit the successful use of a "gear shield" for the bearing lubrication without excessive heating or bearing wear. The double reduction unit shown in Fig. 4 is designed for lubricating both teeth and bearings with the same lubricant.

The result of such lubricating practice is that the gear user has had to purchase in addition to the gear drives, an expensive oil circulating and filtering system and in many cases oversize drives.

A recent development in pinion stand design, using small individual circulating systems for each stand, has proven successful and eliminates the necessity of supplying large filtering and circulating systems. Figs. 2 and 3 show pinion stands designed for this system of lubrication.

Production requirements in recent years have forced the operation of most mills at an overloaded condition and the operating departments have demanded better lubricants to protect the gear drives to enable them to withstand the increased loads without excessive replacement and maintenance costs. In addition, competition requires that the manufacturers of industrial drives avail themselves of the new developments in the art of gear cutting and steel manufacture and treatment and demands that they design their equipment to utilize the high-tooth pressures which the new developents make possible.

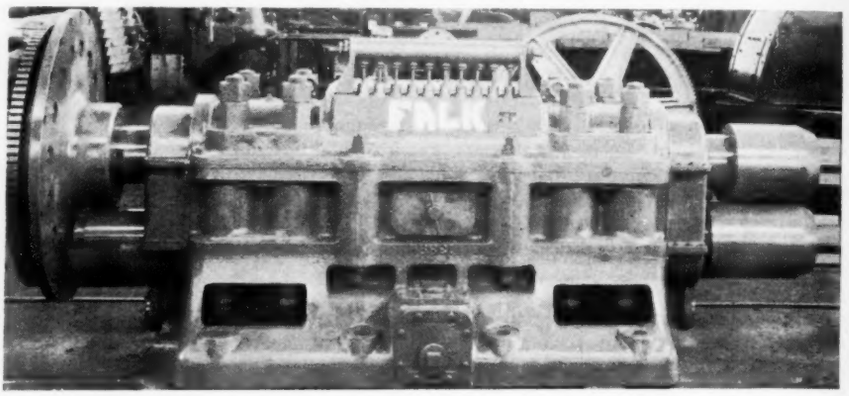

Fig. 3—Pinion stand built with single helical pinions and a separate system of lubrication for bearings and teeth

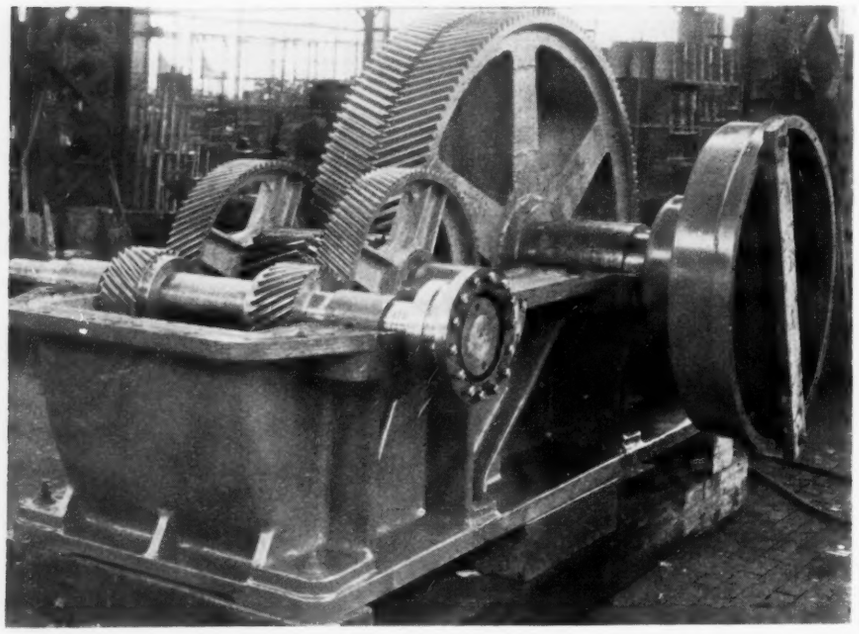

Fig. 4—Open view of speed reducer used for reducing speed from motor to pinion stand of 14-inch 4-high cold strip mill

Manufacturers of rolling mill drives generally concede that oil will not furnish sufficient protection for the gear teeth at these increased tooth pressures under average mill operating conditions. Even the old types of "gear shields" have not proven entirely satisfactory for such work and it appeared that the design of drives would be limited by the ability of the lubricant to maintain a pro-

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Lubrication of Machine Tools Determines Efficiency

WITH the development of the modern machine tool has come increased attention to the question of correct lubrication and its application, machine production being directly contingent upon machine efficiency which, in turn, is contingent upon effective prevention of wear and machine shut-down by proper lubrication. This was pointed out by J. H. Van Campen, chief engineer, Republic Steel Corp., Youngstown, O., who presented a paper dealing with lubrication and its application to machine tools, at the annual meeting of the Association of Iron and Steel Electrical engineers in Cleveland, June 15-19. A session of this meeting was devoted to the general subject of lubrication and much interesting comment developed from the many engineers concerned with this problem.

All Types of Bearings

Present-day machine tools incorporate most all types of bearings in both the plain and antifriction types, operating under all forms of loadings. Correct lubrication of these bearings is understood to be the point where complete and continuous separation of the rubbing surfaces is maintained by an oil or grease film, with sufficient strength to resist the operating pressures with a minimum of fluid friction.

Furthermore, the lubricant should, as nearly as possible, be applied in the correct amount to meet the requirements of effective lubrication, and in addition every precaution should be taken to prevent the infiltration of chips, dirt or other foreign matter.

Methods of applying lubricants to machine tools include oil cups, snap oilers, ring, wick, splash, automatic and semiautomatic systems for oils, and automatic and semiautomatic pressure systems for greases. Mr. Van Campen suggested that a wider adoption of the latter methods would prove beneficial, particularly where a number of points of a machine are to be lubricated, some of which may be in inaccessible or hazardous parts of the machine.

Mr. Van Campen also recommended that where the number of machine tools justifies, one man be placed in charge of lubrication and lubrication records kept on each machine.

The lubrication problem in the electrical apparatus field is complicated by the presence and nature of insulating materials and the practice of passing ventilating air over the insulation surfaces of the machine, according to J. L. Brown, mechanical engineer, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

Mr. Brown stated that nearly all smaller bearings of electrical machinery now in service, and practically all large electric motor bearings, are of the plain or sleeve types. Large sleeve bearings usually are split into upper and lower halves, forming a complete cylinder when placed together.

Withstand High Pressures

For continuous operation and when properly designed these bearings have been found to be ideal. The rotation of the shaft rolls the oil particles under it where they support the load under pressures sometimes as high as 500 pounds per square inch. The feeding of the oil is made automatic by suspending a light brass ring on the shaft and allowing it as it rotates to dip into a reservoir of oil conveniently placed in a recess below the bearing.

However, practical difficulties arise occasionally, even with this simple bearing arrangement; the chief difficulty being leaking of the oil from the bearing housing and subsequent spreading over the insulation with destructive effect. A sealed sleeve split bearing has been designed in which leaking is overcome by complete isolation of the oil rings on other spray forming parts of the bearing from the main housing chamber, thus simulating in this chamber, even during operation, the conditions obtaining at standstill.

Mr. Brown declared that considerable interest has developed in ball and roller bearings for auxiliary motors, a trend which has set up a new problem in lubrication. Although roller bearings are lubricated by grease instead of oil, three difficulties arise from the use of grease: Grease consistency; application of grease to bearings; and destructiveness of the grease to the bearings themselves.

Difficulties with grease have been met by the design of a special housing which permits excess grease to escape automatically and thus any undue churning of the grease is avoided. Fresh grease enters the bearing, passes through, lubricating and cleansing the bearing of old grease, and subsequently passes out as waste. For large and high-speed roller bearings which are lubricated unsatisfactorily by grease, Mr. Brown recommended the use of petrolatum, a pure petroleum product of the consistency of a light grease at ordinary temperatures.

Roll Neck Lubrication Important

An interesting report was presented by the general lubrication committee of the Association of Iron and Steel Electrical Engineers, being a summary of replies to a questionnaire on lubrication sent to a number of steel plants.

The problem of proper roll neck lubrication was considered of great importance, and the solution rests with the grease manufacturer, who must develop new and special greases to meet all conditions. In doing this he not only must be a greasemaker, but also he must accept suggestions from the operator, who in the last analysis bears the grief of poor operating conditions. Competition in price heretofore has reacted unfavorably to the general quality of lubricants, but it is recognized that, irrespective of price

General view along one aisle of the main exhibition hall where a wide variety of steel mill equipment was on display

per pound, a good lubricant must be used to insure efficient operation.

The committee recomended closer cooperation between mill operators, lubrication engineers and manufacturers of automatic grease systems and pressure lubrication devices. The two greatest drawbacks to automatic pressure systems are caking of grease in the system, and small particles of dirt in the grease. The former can be eliminated by the grease manufacturer, while the latter is almost wholly up to the operator. The dust and dirt evil can be avoided largely by the use of a barrel pump, but even with a barrel pump some grease occasionally must be scraped out of the barrel and it is at this time that dirt has a chance to contaminate the grease.

The committee has instituted a lubrication and device development committee, composed of manufacturers of lubricants and devices for application, filtering apparatus, etc. New developments in lubricants and equipment will be broadcast through this committee and it is thought that in this manner information will reach the industry quicker and in a more concise form than through individual efforts of manufacturers.

Heavy Rolling Mill Drives Undergo Drastic Changes

DEMAND for more power for heavy blooming and slabbing mills increased the difficulty of designing the mechanical and electrical parts of the main drive along conventional lines to the point where it became highly desirable to make drastic changes in the form of drive. This fact was brought out by R. H. Wright and H. E. Stokes, engineering department, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., at the session on mill drives.

In discussing a new 54-inch blooming and a 44-inch slabbing mill, each with main rolls driven by independent motors, a valuable feature of the load-carrying scheme, as applied to the motors, was cited. Any desired speed regulation can be obtained without interfering with the load balancing characteristics, and the load balancing effect can be varied without affecting the compounding.

The operating characteristics of the 10,000-horsepower twin-motor drive differ from those of a conventional reversing equipment driving through pinions. The steel enters the rolls without shock and the usual vibration and noise in the mill spindles is absent. The phase positions of the rolls can shift independently so that they can adjust themselves quickly to the steel, thus removing the chief cause of roll chatter. Unusually high rate of acceleration and deceleration of the mill is afforded on account of the comparatively low inertia of the motors, which allows the control to be designed for fast field response without causing high acceleration currents and high reverse power currents. The rapid response of the motors makes the drive more easily handled and the steel is kept close to the mill, with the result that the intervals between passes are reduced.

When applied to wide strip mills, both hot and cold, the twin-motor drive affords the elimination of mill pinions and therefore, the necessity of matching mill rolls. Motor speeds adjust themselves easily so that each roll has the same surface speed.

Selection of motors for driving cold strip mills should be given careful consideration, but this is not particularly difficult if the rolling requirements definitely are known. This was the contention of F. Mohler, industrial enginering department, General Electric Co., Schenectady, N. Y., who traced in detail the development of motors and control for mills of this type.

The modern tandem mill should be driven by adjustable-speed, direct-current motors since they furnish a ready means of obtaining flexibility in speed control. In general, magnetic control is satisfactory for rolling heavy-gage, narrow strip and variable potential control for rolling light gage, wide strip.

A mistake made by many engaged in normalizing steel sheets is that they are too prone to judge a reducing atmosphere by sight, or to name an atmosphere as reducing merely by the content of the unburned carbon monoxide. This point in the manufacture of sheets was emphasized by H. Dobrin, consulting fuel engineer, Pittsburgh, in discussing the practical side of metallurgical heat application. An important element which must be considered is not the extent of the reducing quantity, he stated, but stratification.

Stratification Causes Damage

In some cases he continued, there may have been a shortage of total air admitted with the burner into the fuel, but if the air has been permitted to run into the furnace unit stratified and unmixed, it invariably will damage the material before it has had a chance to mix with the combustibles in the fuel. The degree of damage varies with the temperature within the furnace. At a temperature below 1300 degrees Fahr., he stated, the effect will not be as destructive as it is with mounting temperatures.

An innovation cited by the speaker and which has turned out to be a money saver, has been to graduate an indicating flow meter connected with the open-hearth furnace fuel line not in thousands of cubic feet or gallons, but in dollars and cents per hour. There is something impressive to the mind of the valve manipulator to know that he is sending in $5 worth of gas an hour by the turn of his wrist, the speaker contended, or that he can maintain a proper condition within the furnace by only sending in $3 worth, if the condition of the furnace will permit.

In many plants, Mr. Dobrin contended, a superficial inspection will show that the burner equipment is not functioning properly. Hot flue gases leak out along the sides of the burners. Of the multitude of gages,

A section of the wire division of the exposition, occupied by manufacturers of wire, wire forming machines and accessories

few are in order. Little attention is paid to the instrument board, and there are signs of rust and disuse. Unless this condition is corrected, he said, the beginning of destruction of one burner means the undermining of the good condition of all other burners. Each burner and the entire burner system must be considered as a whole.

The metallurgical combustion department can do a great deal to enlist the interest of the entire organization in their work, by preparing monthly a tabulated chart showing the practice and various efficiencies of the different departments using fuel for metallurgical purposes. The plant organization, he concluded, will learn to avail itself of a combustion department in the measure that such a department makes itself useful.

Furnace control, entirely or in part, for the open-hearth furnace was specified by M. J. Conway, fuel engineer, Luken Steel Co., Coatesville, Pa., as a problem of the application of well-known principles of regulation to suit individual furnace requirements. He cited three types of control as suitable to open-hearth practice. First, a control of air supply that will provide a minimum excess at all rates of fuel B.t.u. input and having flexibility to provide either a reducing or oxidizing atmosphere at the will of the operator. Second, reversal control that gives the combustion air the highest possible reheat consistent with checker design and physical characteristics of the refractory with which both the preheated air and combustion gases are in contact. Third, stack draft control which allows a minimum amount of air infiltration, the maximum transfer of heat from the flame and gases of combustion to the bath and maintaining the necessary velocities through the slag pockets and checkers.

Important factors associated with the operation of open-hearth furnace control mechanisms were stressed by P. S. Dickey, Bailey Meter Co., Cleveland, as including meter accuracy, centralized control and records of heats and furnace campaigns.

Exhibits Signalize Importance of Electrical Equipment in Steel Industry

A FEATURE of the iron and steel electrical engineers' convention attracting much attention was the exposition of iron and steel products and equipment held during the five days of the convention meeting. Approximately 125 exhibitors occupied space at the show and reported large and enthusiastic crowds in attendance.

Products on exhibition included all types of iron and steel mill equipment, lubricating mechanisms, maintenance equipment and electrical devices. Included in this list were all types and sizes of ball and roller bearings, gears and pinions, speed reducers, storage batteries, photoelectric cells, welding machines and welding rods, electric hoists, controllers and contactors, lights and fixtures, and a wide range of electric motors.

One manufacturer exhibited a model open-hearth with automatic temperature difference reversal and combustion control, with colored lights indicating the direction of the flow of gases. Many types of refractories, insulating materials, and high-temperature cement also were displayed.

Fuses, switchboards and control panels were featured prominently, as well as circuit breakers, transformers, pyrometers and other electrical devices.

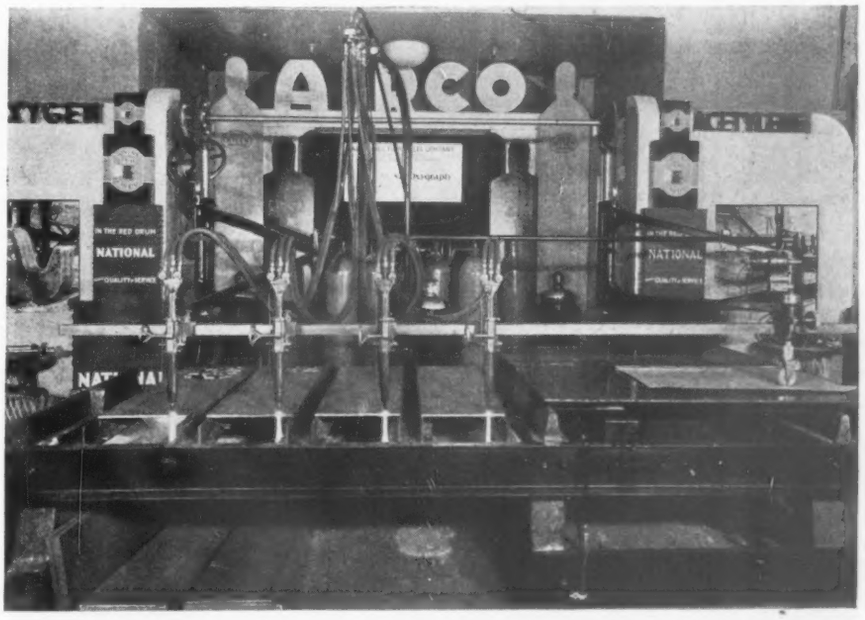
A group of manufacturers displayed various types of lubricants and automatic lubricating equipment applicable to steel mill machinery. An interesting feature of the exhibit of one manufacturer was a group of small aluminum models of various types of cranes, all built to operate in exactly the same manner as the full-size unit.

Much interest was shown in an automatic shape cutting machine, comprising several oxyacetylene torches mounted in a pantograph arrangement for cutting multiple designs from steel plates. This machine is shown in the illustration below.

Tube benders, air compressors, clamshell buckets, and various types of mill rolls were featured in other exhibits.

A separate section of the exhibition was devoted to wire machines, wire products and equipment. Several manufacturers in this section had wire drawing machines in operation as well as die cutting and polishing machines, straighteners, benders, etc. Tungsten carbide and tantalum carbide tool materials and dies were displayed prominently.

Exhibitors in general reported satisfactory results from the show and indications were that many in attendance had made special trips to examine the new equipment on display.



Automatc oxyacetylene shape cutting machine. The profile of the design is traced by the master wheel and arm at the extreme right, the torches reproducing this shape in the steel plate

Continuous Furnaces Will Serve Hot Tin Mills

Officials of the Granite City Steel Co., Granite City, Ill., have authorized the construction of three continuous pair and pack heating furnaces at their tin mill department. They will be of the walking-beam type, having two rows operating independently with full-automatic discharge features.

The units will be built by the Surface Combustion Corp., Toledo, O.

Local Preheating Is Substitute for Furnace in Welding Aluminum

IN SPITE of the recommended practice of carefully supporting aluminum castings in process of preheating in the furnace preparatory to welding, experienced aluminum welders frequently dispense with this procedure and handle even complicated jobs entirely with local preheating, using an oil burner for the purpose. Technique employed in this method is interesting.

The accompanying illustration shows a welder successfully at work on an aluminum casting 56 inches diameter and ¾-inch thick. It is the lid of a rotary bottling machine, cracked from one edge to about 20 inches toward the center. The circular shape of the casting simplified the expansion problem, although it was complicated somewhat by a manhole opening at one edge through which the crack passed, and by the fact that where the reinforcing ribs passed through the center bearings, the metal was considerably heavier than elsewhere.

Difficulty of penetrating the full thickness without forming projections of metal on the inside was ecountered because of the 3-inch thickness of the crown. To avoid extensive finishing this had to be overcome. It was also desirable to heat it locally along the crack, just ahead of the welding flame, so the welding heat would not create a sudden rise in temperature and cause further cracking.

Briefly the procedure was as follows: A steel plate was formed to fit the inside of the lid, and clamped to it along the crack. Then the casting was fastened to a flat surface and the two sides of the break were aligned at the open end by a steel strap clamped in position. Then the opening was veed carefully.

First the entire length of the break was heated slightly with an oil burner. Welding then was started at the inner end of the break, with the preheater heating the aluminum thoroughly a few inches ahead. To insure a sound weld, both a puddling rod and cast aluminum flux were used. The puddling rod is used to remove oxide from the surface of the molten weld metal. As work progressed the preheater still was kept playing along the break ahead of the welding flame. This opened the crack up to the limit of expansion. As sections of the break were finished a covering of asbestos paper was laid on, and during the entire process care was taken to keep drafts of cool air from the work.

Repairing the cracked 56-inch lid of a rotary bottling machine. The operator in the rear is preheating the crack ahead of the welding flame

Analyses and Applications Of Modern Tool Steels

(*Concluded from Page* 32)

the finished product. The former may be known as industrial users and the latter as tool manufacturers.

In the class of industrial users are soft steel manufacturers whose products in most cases include hot-rolled semifinished material, such as structural shapes, rails, bars, plates, billets and slabs. In these plants a large part of the tool steel is used in roll turning shops and machine shops which are engaged in maintenance work. The roll shop will use high-speed steel for roughing and often for finishing cuts on rolls. On chill iron rolls high-carbon or tungsten finishing steel is used for the smooth finishing cuts required. In the machine shops a general purpose high-speed steel meets the requirements which are chiefly for lathe, planer, and boring tools. Some call exists here for straight carbon tool steel, also used for general work such as blacksmith tools, chisels, cold cutters, crow bars, etc. Shear blades for hot and cold work form a sizable item, the former generally requiring tungsten hot die or low-carbon high-speed steel, while the latter are often straight carbon and sometimes of the carbon-vanadium type.

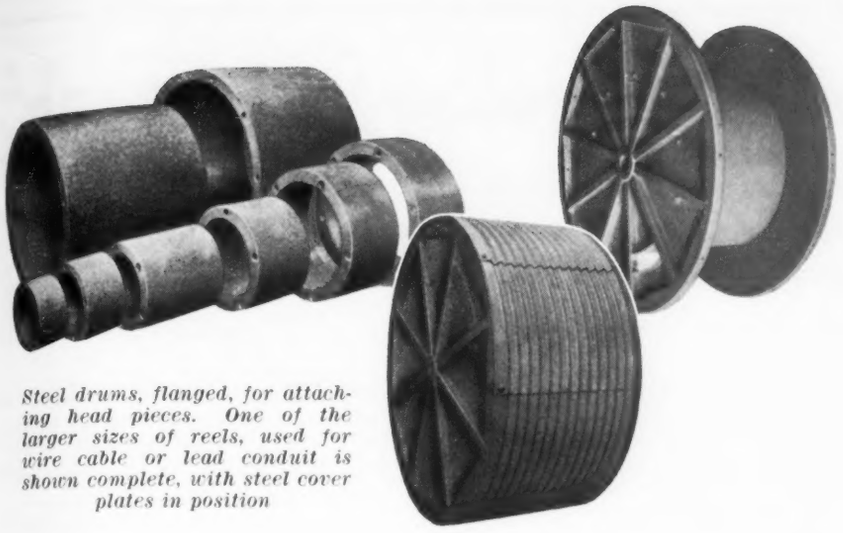
Rail mills almost without exception go in for some track specialties such as splice bars, tie plates, track bolts, and spikes, and in these departments considerable tool steel is used. In the first place a production job is found in drilling holes in the rails for track bolts. Formerly this was a hot punch job, but many specifications now call for drilled holes. Flat drills are used of high-speed steel in a flat or bead section. The ends of the rails in some cases are milled square with inserted tooth milling cutters. Splice bar generally is sheared and punched hot. Tie plate is handled both hot and cold and the punching of the square holes calls for severe service on the part of the tools. Tungsten hot die punches and dies are used for working splice bar. Low-carbon high-speed steel is used for hot tie plate punching, while for cold work one of the tungsten alloy punch steels appears to be most popular. The steels used in the production of track bolts will be discussed later under bolt manufacturing.

(*To be concluded*)

Simplified Practices Are Given Approval

Having received a sufficient number of acceptances from manufacturers, distributors and users, the division of simplified practice, department of commerce, Washington, announces that the proposed simplified practice recommendation on forged tools will be made effective July 1.

The division also announces that the standing committee representing manufacturers, distributors and users of cut tacks and small cut nails has reaffirmed the existing schedule for these products without change for the ensuing year.



Steel drums, flanged, for attaching head pieces. One of the larger sizes of reels, used for wire cable or lead conduit is shown complete, with steel cover plates in position

Large Uses of Steel in Small Ways

194th Article ◆ Reels

STEEL is replacing wood in the manufacture of reels for heavy wire, cable and lead conduit. Thus another "infant industry," the making of these reels, is coming to the fore as a substantial consumer. The industry did not exist in 1925; now three companies are engaged in it and together normally use about 5000 tons of steel in a year. During 1928 and 1929 consumption was at a much higher rate.

Wooden reels have been in use many years and still predominate. When the reels are "empty" they are shipped back for reloading. A considerable amount of wood is used in their construction, and they are built strongly to withstand shipping strains. But after a few trips they must be repaired or rebuilt.

To reduce this cost, provide better protection and develop a structure on which longer lengths of cable could be shipped safely, the Western Electric Co. began a series of experiments with steel in 1926. These resulted first in the development of one-piece flanged drum, to which wooden head pieces could be bolted. Next head pieces were made of steel. Wood "two by fours" still were used for covering the cable, but finally corrugated lags were developed.

An all-steel reel was produced entirely by welding, a reel which could be assembled for loading, and taken apart for return shipment, quickly and easily. Tests lead the manufacturers to say these reels will withstand 10 years continuous service, as against three to four for wood. They are 20 per cent lighter than the wooden reels. The Western Electric Co., which started the industry, now has more than 50,000 all-steel reels, and steel drums in service.

Adapted to Other Uses

The manufacturers saw further possibilities in the idea. They have developed types for various purposes, all made of steel, for long life, and of specialized construction for easy assembly. One of these is intended for welding wire. The welding wire need not be shipped on reels, but in the form of rolls. When it arrives at the consumer's plant, one of the end pieces of the reel is detached, and the roll slipped over the drum. The end piece is then re-attached simply by screwing it down on the ferrule. "Feeder" reels of various types are being devised.

Steel drums are made in sizes from 6 inches diameter and 4 inches traverse, up to 60 inches diameter, and of any desired traverse. The flanges permit them to be used interchangeably with wooden or steel heads. The gages of steel used range from No. 16 to No. 10.

The steel head pieces for the smaller size drums generally are No. 12 gage, either with straight or rolled edges. No. 12 gage high-carbon steel is used for the parts making up the head pieces for the larger sizes intended for cable and conduit. The spokes are U-shape pieces welded to the main plates. The corrugated lags are made of No. 12 gage, high-carbon, copper bearing steel.

Head pieces are fastened to the drums by means of through rods, threaded at the ends. Heavy treads are welded to the plates. Speed bolts fastening the lags to the head pieces are case hardened. The overall diameter of these large size reels in commercial use is 78 inches, the diameter of drums, 48 inches, and the width between heads, 36 inches. Reels of this size weigh approximately 1 ton, though some specially large sizes have been constructed weighing 2875 pounds.

High-Speed Mill Drives Need Better Lubricants

(*Concluded from Page* 34)

tective film between the teeth.

To keep pace with the mechanical developments in mill drive design and meet the new lubricating problems involved a new product for combined gear protection and bearing lubrication has been developed. The perfected product is a high-grade mineral oil into which lead oleate has been incorporated in intimate combination. Tests in the laboratory and in the field under practical operating conditions indicate that it is capable of maintaining a protective film at from three to five times the pressure that an oil of similar viscosity will stand. The unusual feature of this product is that, used as a bearing lubricant, it will carry heavier loads than oil and run at higher speeds with marked reductions of temperatures. It is, also, more fluid at low temperatures and more viscous at high temperatures, a desirable feature in view of the fact that most mill equipment is exposed to wide temperature variations.

While originally developed to withstand excessive tooth pressures encountered in modern automobile transmission design, its use recently has been extended for combined tooth protection and bearing lubrication in industrial drives. The ability of the lubricant to withstand high pressures enables the designer to utilize the latest developments in design and permits increased loads to be carried on old installations without excessive maintenance.

Adopts Pipe Standards

Commerical standards for wrought iron pipe nipples, recently accepted by the industry, have been published by the bureau of standards, Washington, in pamphlet form designated CS6-31. Dimensions for standard weight pipe, taper pipe thread dimensions, stock sizes and length of standard weight black and galvanized pipe nipples and packing are tabulated.

Scanning the Technology of Steel

A Digest of Important Developments in Scientific Research, Engineering Progress and Operating Procedure Pertaining to the Production, Processing, Application and Performance of Steel

Blast Furnace Gas

Use of blast furnace gas in metallurgical heating furnaces, discussed by C. B. Thorne, in Blast Furnace and Steel Plant, June 1931, *p.* 839, 7¾ *pp.*, 3 *tables*, 7 *illusts.*

The lower thermal value of blast furnace gas can be compensated for by preheating the gas or its combustion air or by the addition of a small amount of coke oven gas. In the case of soaking pits, bending furnaces, annealing furnaces and certain other heating units, simple preheating of the air will suffice. In other cases such as open-hearth, welding and billet furnaces a small amount of coke oven gas mixed with blast furnace gas is desirable. In order to use blast furnace gas or mixed gas efficiently it must be under accurate control. A gas holder is helpful and it is best to place a pressure regulator of the motor-operated butterfly type just ahead of each large furnace or group of small furnaces. When coke oven gas is mixed with blast furnace gas, the proportions of the two gases should be under the control of a ratio device which balances the relative volumes of the two gases flowing through orifices in the lines. Advantages resulting from the use of mixed gas in the open-hearth furnace and other furnaces concludes the article.

—STEEL, 6-25-31

Corrosion of Ship Plates

Deterioration of iron and steel in hulls and fittings of ships, discussed by J. W. Donaldson, in Iron and Steel Industry (London), June 1931, *p.* 313, 3 *pp.*, 2 *tables.*

Corrosion arising in surfaces away from rivets may be due to two causes. In the rolling of steel plates a scale is formed, which if not removed before painting, may result in corrosion, especially if the paint becomes defective or is removed. The depolarizing action, which occurs when iron is immersed in aerated water, takes place on mill scale, and if scale is broken at a particular point, corrosion takes place rapidly resulting in pitting. Another cause of corrosion in parts of shell plates remote from rivets results from the segregation of the nonmetallic impurities in the shell setting up the necessary potential difference to produce pitting in their vicinity. As a protective coating, red lead paint generally is considered as the most satisfactory. Antifouling paints usually are applied after the shell has been painted with a protective medium. The author presents two tables, one showing the results of a series of tests to determine the relative corrosiveness of various commercial forms of iron and steel and the other to determine the electrolytic action which takes place when these materials are in contact with sea water.

—STEEL, 6-25-31

Coloring Wire Products

Low cost processes used in Germany for black coloring wire products, discussed in Wire and Wire Products, June 1931, *p.* 228, 2¼ *pp.*

For nails and the like the most popular and practical process is burning with an oil or fat. This is used in the form of sawdust saturated with oil and the process is carried out in such a manner that a drum first is filled one-quarter full of the articles to be blackened. The drum then is filled to the second quarter with the oil-sawdust mixture after which the drum is rotated over a source of heat. The oil-sawdust mixture is carbonized and the articles covered with a deep black coating. The author describes various methods of coloring pins, needles, ironware, and other commodities and presents detailed information on mass production and lacquering.

—STEEL, 6-25-31

Automatic Substations

Modern electric equipment in operation at the National Tube Co., McKeesport, Pa., described by W. E. Waldron, in General Electric Review, June 1931, *p.* 394, 5 *pp.*, 7 *illusts.*

Direct-current load consists of about 1950 motors, which represent a total connected horsepower of 47,500, of which 32 per cent is installed on cranes. In addition, there is a direct-current lighting load of about 1500 kilowatts. Power is delivered by a main bus made up of fireproof and weatherproof cables supported by steel towers, steel poles and mill-building roof trusses. All branch feeders from this main bus are tied in solid, there being no circuit breakers or any form of disconnecting switches. The load is supplied from six substations located near the load centers.

—STEEL, 6-25-31

Strip Mill Drives

Development and controls for cold strip mill installation, discussed by F. Mohler, in Iron and Steel Engineer, June 1931, *p.* 272, 16 *pp.*, 14 *illusts.*

A brief description of the cold rolling process is presented by the author. The per cent reductions encountered in rolling practice and the various combinations of rolls used are explained. A list of standard line motors designed for driving cold strip mills and a partial list of motors recently installed are tabulated. A direct-current adjustable-speed motor, in the author's opinion, is the only logical motor to use for a reel drive. Data also are presented on mill motor control, reel motor control and tension between mill stands.

—STEEL, 6-25-31

Steel in Bridges

Various types of steel used in some of the world's longest span bridges, by D. B. Steinman in Metal Progress, June 1931, *p.* 33, 7 *pp.*, 8 *illusts*, 1 *table.*

Development of longer span bridges has created an impelling need for high-strength steels. Accordingly the bridge engineer looks to the metallurgist to furnish these steels which will combine the factors of suitability, safety, dependability and economy. The objective in developing high-strength steels should be to obtain high elastic limit with unimpaired ductility.

The high-strength steels that have thus far been used successfully in bridge construction have been of three classifications: Alloy steel, heat treated carbon steel and cold drawn high-carbon steel. Nickel steel, silicon steel and manganese steel in the alloy classification, have been used in large amounts in many of the longest and best known suspension, cantilever and truss span bridges.

The author outlines 15 points which the metallurgist and steel producer should keep in mind with regard to high-strength steels for bridges.

—STEEL, 6-25-31

Machine Tools and Plant Equipment

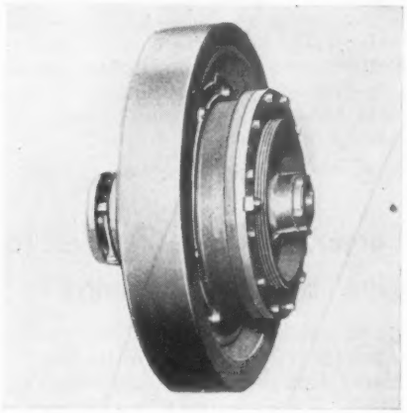
«Without machine tools modern machinery could not be built.»
—Joseph W. Roe

Compact Magnetic Clutch Has High Capacity

Magnetic Mfg. Co., Milwaukee, has developed a multiple-disk magnetic clutch featuring simplicity and compactness. This clutch, shown in the accompanying illustration, is said to provide maximum horsepower carrying capacity, pull-out torque and the advantages of smaller magnetic clutches by way of ease of operation, smooth acceleration and low maintenance cost.

With a 24-inch diameter clutch, over 6500-foot pounds pull-out torque can be developed, ample friction lining enabling low unit pressure and resulting in long life. The clutch is claimed to provide greater desired slippage than the ordinary clutch of similar specifications.

The magnetic control of a press built by E. W. Bliss Co., Fifty-third street and Second avenue, Brooklyn, N. Y., which was described on Page 81 of the May 7 issue of STEEL, was achieved through this clutch.



Multiple disk magnetic clutch designed by Magnetic Mfg. Co.

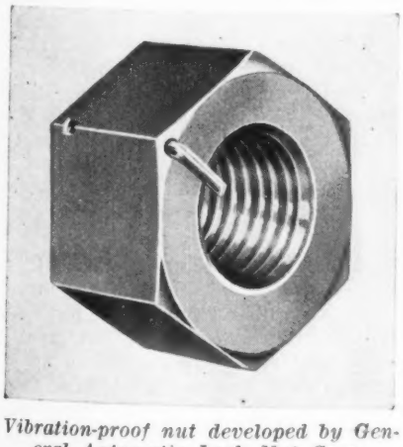
◆

Simple Spring Pin Detail Gives Nuts Positive Lock

General Automatic Lock Nut Corp., General Motors building, New York, has developed a simple type of locknut which requires no washers and which fits any standard thread. One of these nuts appears in the accompanying illustration, which plainly shows the locking device.

The nut itself is standard, the locking device consisting of an L-shaped wire spring pin which is locked into a hole in one corner of the nut with its beveled point protruding over the bore. As the nut is screwed on, this locking pin engages the thread of the bolt and follows it along, being twisted slightly to one side. This holds the point against the root of the thread, the pin tending to bite in and thereby maintain adjustment against vibration and shock.

The nut is removed with an ordinary wrench as easily as is an ordinary plain nut. Only momentary pressure with the wrench is required to throw the pin over, thereby releasing its impinged point and permitting it to slide freely over the root of the bolt thread as the nut is unscrewed.



Vibration-proof nut developed by General Automatic Lock Nut Corp.

◆

New Reversing Starter Has Push Button Control

Cutler-Hammer Inc., Twelfth and St. Paul avenues, Milwaukee, has developed a new reversing starter for small alternating and direct-current motors. The accompanying illustration shows one of these starters.

It is designed to function across the line in connection with polyphase motors up to 3 horsepower used for operating hoists, lifts, garage doors, small machine tools and other equipment where a half-time intermittent duty reversing starter is required. Reversing is accomplished by means of two mechanically interlocked magnetic contactors, remote controlled by means of a separate pushbutton master station.

The contactors are of a new three-pole design. Silver-to-silver contacts reduce arcing and pitting to a minimum and assure maximum current carrying capacity at all times. The magnet structure consists of a laminated frame with a shading coil for alternating current and a brass shield for direct current.

Small size and high operating efficiency are features of the new starter. Overall size is 7 1/16 x 8 7/16 x 4 7/16 inches. Two types are furnished, one arranged for two-wire control only, with a maximum capacity of 1 horsepower, the other arranged for either two or three-wire remote control, with maximum capacity of 3 horsepower.

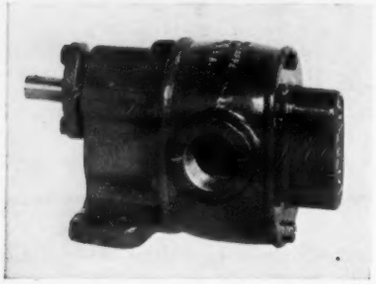
◆

Industrial Thermometer Is of Improved Design

C. J. Tagliabue Mfg. Co., Park and Nostrand avenues, Brooklyn, N. Y., announces a new mercury tube industrial thermometer of snap case-front type. It is pointed out that this feature makes cleaning easy, and at the same time renders breakage of the easily removable glass front almost impossible.

A tongue at the base of the case fits snugly into a groove in the front so that when opening and closing the

Cutler-Hammer reversing starter for alternating or direct current motors



Brown & Sharpe gear pump built to deliver 30-gallons per minute

front it cannot slip and fall. It requires but little effort to remove, clean and replace this new front, which when in position on the instrument, is held firmly closed by a simple snap device.

Other Features of Design

The maker points out several other improved construction features in connection with these thermometers, among which are: Easy reading glass; connecting piece locked to case by specially designed split spring washer; asbestos packing uniformly compressed around enlargement on glass stem to prevent movement of tube with reference to scale; thin monel metal bulb chamber which at the same time is rugged, noncorrosive, nonamalgamating with mercury and with quick heat conductivity; left hand thread on bulb chamber which prevents loosening if case is turned in removing thermometer from socket; and mercury filling in bulb chamber completely surrounding bulb, thereby insuring almost instantaneous transmission of heat to the bulb itself.

◆

Recording Instrument Uses Electronic Tubes

General Electric Co., Schenectady, N. Y., has developed a photoelectric recorder which gives increased sensitivity to instruments such as voltmeters, ammeters, etc. One of these instruments, with its record chart in position, is shown in the accompanying illustration.

The inking pen of this new recorder is driven by a small high-torque element energized from an auxiliary source of power. Directly beneath the recording element is an indicating instrument element operated by the energy to be recorded. A photoelectric circuit and an optical system of special design cause the recording element to follow the indicating element and thereby to make an immediate, accurate and continuous record of the resulting deflection.

Previously, inertia of the recording pen and other mechanical parts of a recording instrument, due to their unavoidable weight, has made it impossible for such an instrument to respond as quickly or to as small a quantity as could an indicating instrument. In this present case, however, a beam of light, which has no weight, in conjunction with photoelectric and pliotron tubes, avoid this difficulty, thereby making it possible accurately to record energy in minute quantities.

◆

Larger Model Is Added to Line of Geared Pumps

Brown & Sharpe Mfg. Co., Providence, R. I., has added to its line of geared pumps one of larger size, this giving 15 gallons per minute capacity at 500 revolutions per minute, with 3 gallons per minute increase in discharge for each 100 revolutions per minute increase in speed, up to a maximum of 30 gallons per minute at 1000 revolutions per minute. Suction and discharge ports of 1¼-inch pipe size provide unrestricted flow of the maximum volume. The accompanying illustration shows one of these pumps.

Design and construction are similar to those of smaller size built by this company. It is particularly adapted for service as a coolant pump for machine tools, large volume assuring copious flow of coolant, either under pressure for drilling and for flushing out chips, or at low pressure in cases where a cascade of coolant is desired. For larger machinery, it makes an efficient pump for circulating lubricating oil.

Its use is by no means confined to machine tools, it being recommended for general industrial applications. Where a self-contained unit is desired, it can be furnished with direct motor drive.

Photoelectric recording instrument designed by General Electric Co.

Portable air-driven grinder built by Cleveland Pneumatic Tool Co.

◆

Air-Driven Grinder Has Single Rotor Motor

Cleveland Pneumatic Tool Co., Cleveland, recently placed on the market the pneumatic grinder illustrated above. The unit is designed with a single rotor which is concentric with the arbor, providing a good balance at all speeds. That type motor is claimed to have great power in compact form and to operate with the minimum vibration and recoil. The rotor is provided with four longitudinal slots to accommodate four separate blades. When the machine is in operation, the blades are forced outward toward the wall of a stationary cylinder concentric to the axis of the rotor. One blade always is exposed to the air pressure.

Details of Arbor and Governor

The arbor, to which the rotor unit is attached, is rigid and is made of hardened and ground steel. It is equipped with a combination annular and thrust ball bearing at the rear end and with a double row annular ball bearing at the forward end. The governor is a detachable unit and when in operation, controls the amount of compressed air used. When the machine is running light and is not grinding, the air consumption is reduced to about one-third. When grinding, the governor opens gradually.

An oil reservoir in the rear of the grinder body automatically lubricates the rotor. Flow of oil is controlled by the governor. That lubrication system allows the oil to flow through large unrestricted passages to give steady and free lubrication without danger of foreign material clogging the oil supply. The grinder

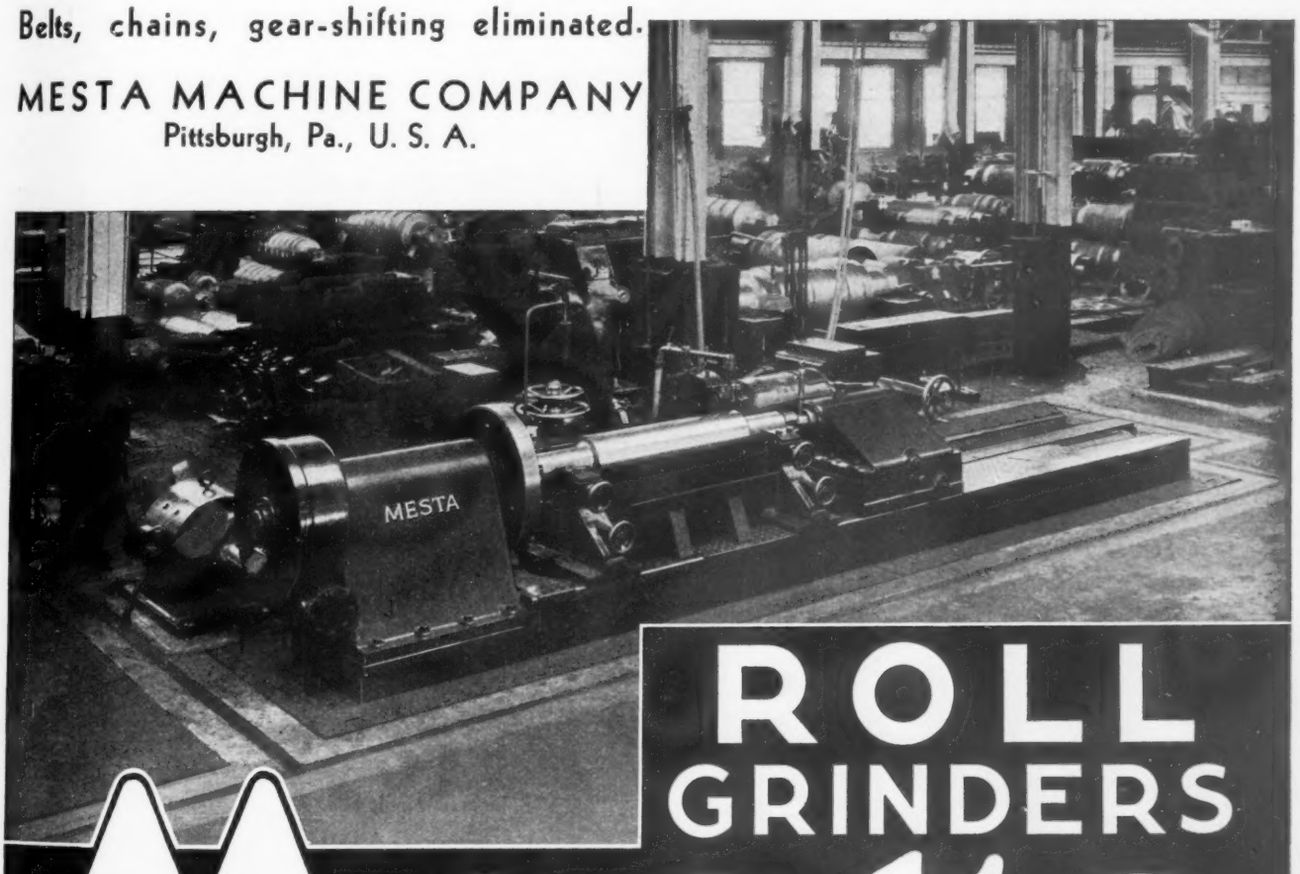
FROM THE - - - - - - - -
OPERATING STANDPOINT

A machine of precision for the finest finishing—but rugged enough to do the heaviest kind of roughing work. Crowning and concaving attachment an integral part of machine and guaranteed to produce any desired amount of crowning or concaving absolutely uniform and accurate.

Anti-friction bearings throughout.

Belts, chains, gear-shifting eliminated.

MESTA MACHINE COMPANY
Pittsburgh, Pa., U. S. A.



ROLL GRINDERS

Mesta

is made in several sizes and styles. Two types of handles provide outside or inside throttle lever control.

◆

Roller Bearings Are Built To Withstand Shocks

Aetna Ball Bearing Mfg. Co., Chicago, recently has placed on the market a complete line of roller bearings, which are designed to sustain heavy loads and sudden shocks. One of these bearings is shown in the accompanying illustration.

The outer race is free from lips or shoulders, while the inner race has a double lip. Since the rollers are free to move longitudinally across the face of the outer race, endwise movement of the shaft due to load, expansion, contraction or distortion, is possible without danger of misalignment or cramping.

High grade bearing steel is used for races and rollers, the races being hardened, ground and lapped, while the carefully hardened rollers are finished by centerless grinding and also are ground on both ends. Retainers are designed to allow minimum width of race with maximum bearing surface, thereby allowing compact construction. Retainers may be either steel or brass. The line comprises 64 bearings, for light, medium or heavy duty, in sizes ranging from $1\frac{3}{16}$ to $10\frac{7}{8}$-inch outside diameter, being interchangeable with S.A.E. standard ball bearings.

◆

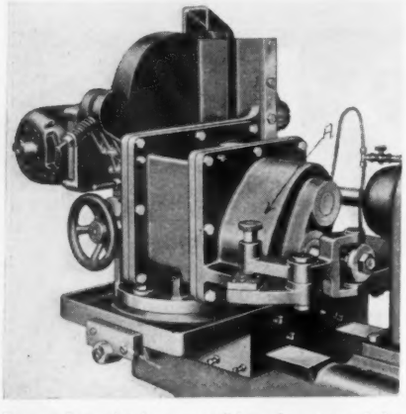
Gear Chamfering Machine Suited to Jobbing Work

City Machine & Tool Works, East Third at June street, Dayton, O., announces a universal type of gear tooth chamfering machine. The head of this machine, in which the primary improvements are incorporated, is shown in the accompanying illustration.

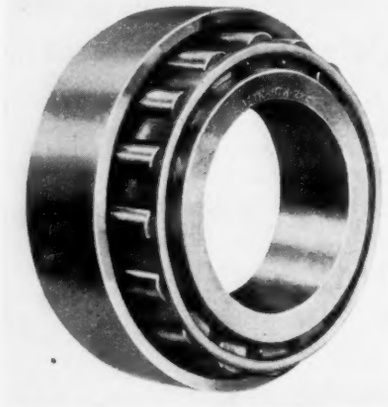
In this machine the necessity for installing different cams for each pitch of gear is avoided. Instead, four or five cams of different pitches are loaded on a sliding shaft, and simply by shifting the lever, marked "A" in the illustration, the proper one is brought into operation.

The worm and idler gear are unaffected by pitch changes and the principal variable is the driving gear. This varies according to the number of teeth to be chamfered, that is, each gear to chamfered must be driven by a gear with equal the number or double the number, of its teeth. This is accomplished by the use of both single and double thread quick change worms, thus necessitating having only about half the usual number of drive gears. On small lots it often is possible to use one of the gears to be chamfered as a driving gear, thus avoiding expense of a special driver.

The builder recommends this machine particularly for use in jobbing gear plants, in machine tool plants, and in other plants wherein gears of various sorts are put through in relatively small lots.



Gear chamfering machine improved by City Machine & Tool Co.

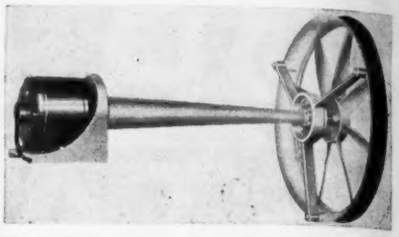


Heavy duty roller bearing designed by Aetna Ball Bearing Mfg. Co.

◆

Motor Driven Fan Unit Has Airplane Type Blades

Propellair Inc., Columbus, O., recently has introduced a new type extension shaft fan built on the airplane propeller principle. The unit may be utilized for any application where medium pressure is necessary and where the motor must be kept out of the air flow. Particular attention has been paid to the length of the extension in designing the new fan. Each extension is designed to fit into an elbow in a duct line so that the elbow proper is 1½ times the diameter of the duct. With a fan of the type mentioned equipped with a proper length extension, it is claimed that installation is simplified, the cost reduced and efficiency increased. The accompanying illustration shows one of the new units.



Propellair extension type fan built along airplane propeller lines

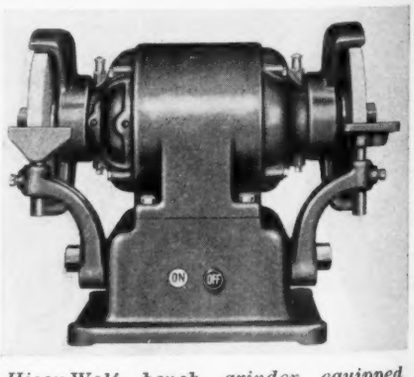
◆

Motorized Grinders Meet New Electrical Codes

Hisey-Wolf Machine Co., Cincinnati, announces improvements in its line of motor-wriven grinders for use with 6 and 7-inch diameter wheels. One of these grinders is shown in an accompanying illustration.

In order to comply with increasingly stringent electrical codes going into effect in many industrial, localities, an improved commutating-type repulsion induction motor has been incorporated into these grinders. The starting current required by this new motor is unusually low, it being, according to the manufacturer, less than one-third that of a split-phase motor.

Low voltage due to line drop is ordinarily an unavoidable and objectionable factor in grinder operation, but it has no ill effect in the case of these new grinders. It is pointed



Hisey-Wolf bench grinder equipped with improved driving motor

An Innovation in Hot Bed Design

(patents applied for)

Sponge iron that enters the Birdsboro built 900 ton Ingot Press, recently installed in the new Ambridge plant of the A. M. Byers Company, finally stages its colorful career as rolled skelp working its way, by degrees, across the thirty five foot expanse of the specially constructed hot-bed — also of Birdsboro design and build.

Being of the convertible *notch bar-flat bar* type of bed, the Byers' installation (illustrated) known as the 18" — 16" skelp mill design, is capable of handling skelp up to a 19" width and ⅞" thickness with the *flat bar* arrangement in position — which also permits the free travel of rounds. With the mechanical action of the turning device, the *notch bars* are readily brought into position.

Shuffle bars complete the transfer, bringing the stock onto the run-out table, from which point it is sheared and piled. The bed's total length is 162 feet.

BIRDSBORO
STEEL FOUNDRY AND MACHINE COMPANY
DESIGNERS AND BUILDERS
BIRDSBORO, PENNSYLVANIA

Heavy duty pneumatic drill built by Buckeye Portable Tool Co.

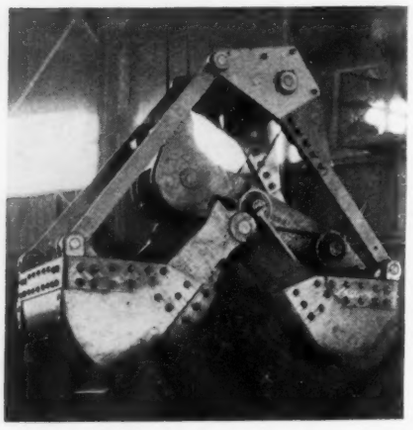
out that by eliminating the usual centrifugal switch, a certain drag is done away with, which allows the grinder to start instantly and to come up to full speed immediately.

◆

Hook-on Clamshell Bucket Is Designed for Strength

Erie Steel Construction Co., Erie, Pa., recently introduced a hook-on or single line clamshell bucket which it is claimed is designed to give 10 to 25 per cent more closing power than those previously made. Complete operation of the bucket is carried on from the crane cab and the action is quick, positive and safe because the latching mechanism cannot become disengaged through accidental means.

The closing line is reeved around snubber sheaves which tend to eliminate serious opening shock. When the bucket is open, the power arm comes to rest against heavy bumper springs which act in combination with the rope reeving to give smooth operation. As shown in the accompanying illustration, the scoops are reinforced. High carbon steel lips extend to the top of the scoops and tie in with hinges at that point. The back band extends entirely around the scoop and also ties in with the hinges.



Powerful clamshell bucket developed by Erie Steel Construction Co.

◆

New Air-Driven Drills Are Light and Powerful

Buckeye Portable Tool Co., Dayton, O., announces an addition to its present line of portable pneumatic tools, this being a heavy-duty drill and reamer which also is fitted for nut driving. One of these is shown in the accompanying illustration.

Drive is by a stationary valve motor, which gives maximum torque at the relatively low speeds at which these heavy-duty tools must operate. This type of motor is said to be singularly free from vibration.

The tools weigh only about 40 pounds each, and two models are available, one with spindle speed of 68 revolutions per minute, the other with spindle speed of 120 revolutions per minute. As a drill, the tool is equipped with a No. 5 Morse taper socket, and as a nut driver with a ⅞-inch square spindle. Feed is controlled by a ratchet wrench, a spade handle or a breast plate, these being interchangeable.

These tools are recommended by the maker for use on structural steel work, in ship building, in railroad shops and on heavy machinery.

◆

Special Lift Trucks Built To Handle Tin Plate

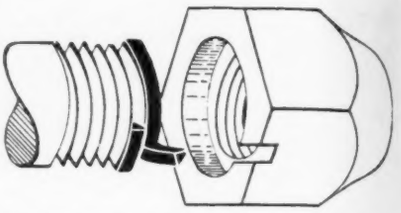
Barrett-Cravens Co., 101 West Eighty-seventh street, Chicago, has developed a special lift truck for handling tin plate. One of these is shown in the accompanying illustration.

The machine is of fork type, its height of only 3½ inches allowing it to go under stacks of tin plate, which is shipped on 2 x 4-inch skids. Thus each pile of tin plate can be picked up in a freight car and trucked directly to the stockroom in the plant without unstacking and restacking, as ordinarily is necessary. The maker claims that this improved method cuts plate unloading costs by more than one-half.

◆

Thread-Form Wire Springs Give Nuts Positive Grip

Safety Nut Corp., Land Title building, Philadelphia, has developed two new types of nuts—one known as the pin type, the other known as the brake type—in which ingenious application of thread-form spring wire is made to make the nuts self-locking at any point along a bolt. One of these nuts is shown in detail in the accompanying line cut, this being one of brake type.

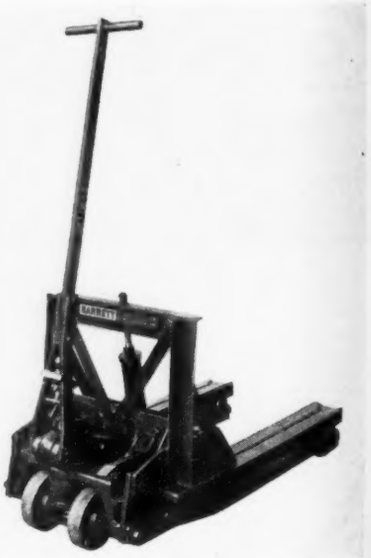


Brake type lock nut developed by Safety Nut Corp.

The pin type nuts are counterbored and have a groove, or grooves, cut tangentially in their top surfaces. Into these grooves is slipped the pin or key of thread-form spring wire, this being bent to lie in a counterbored space in the hole, partly surrounding and pressing down into the bolt thread. Friction thus created holds the setting of the nuts on their bolts unless they deliberately are unscrewed by means of a wrench.

Design and Operation of Brake

In the case of the brake type nuts, one radial slot is cut in the nut to retain the extension, or handle of the brake band, which simply is a piece of thread-form spring wire bent to one full helix turn, with one end bent outward to form the handle. When this band is placed in the counterbored base of the nut, and the nut screwed on its bolt, the band seats down into the bolt thread so as to hold the setting against jars and vibration.



Barrett-Cravens lift truck designed for economical tin plate handling

Markets Gain More Solid Support

Heavier Structural Steel and Pipe Awards Further Tend To Buoy Improved Sentiment —Current Operations Drop to 36 Per Cent—Downward Drift in Prices Slower

IMPROVED sentiment manifest last week in the steel markets not only has acquired additional momentum, principally from developments in the world of international relations and finance, but also has received more tangible backing in the form of noteworthy activity in structural steel and pipe.

Including 20,385 tons for a Louisville & Nashville railroad bridge at Henderson, Ky., booked by the American Bridge Co., structural steel orders this week total 40,140 tons. This brings structural orders for 1931 to date to 1,004,927 tons, compared with 901,098 tons a year ago.

Fresh structural inquiry this week exceeds 53,500 tons, notable being 17,100 tons for New Jersey highway work, 15,000 tons for an elevated highway in New York, and 8000 to 10,000 tons for docks in New York. This is exclusive of 72,000 tons of structural steel, 28,000 tons of cable, and 10,000 tons of miscellaneous steel for the Golden Gate bridge at San Francisco, for which subsidiaries of the United States Steel Corp. and Bethlehem Steel Corp., and American Cable Co. are low.

The most substantial line pipe awards in several months include 41,000 tons of 26-inch for an Illinois gas utility, booked by Youngstown Sheet & Tube Co.; 17,000 tons of 10¾-inch pipe placed by the Shell Union Oil Corp. with the Jones & Laughlin Steel Corp.; 5500 tons of 14-inch by the Phoenix Utility Co. with the National Tube Co., and several thousand tons of miscellaneous pipe, 10-inch and smaller, also placed by Phoenix with National Tube, Jones & Laughlin, Republic Steel Corp., and A. O. Smith Corp. The Irak Petroleum Co., comprising American, French and British interests, has placed contracts for a $13,500,000 pipe line from the Tigris to the Mediterranean sea, requiring 160,000 to 180,000 tons.

Cast iron pipe also is more active, topped by awards of 3500 tons by Lancaster, Pa., and 2000 tons by Parkersburg, W. Va.

In lesser degree, railroad requirements have expanded. The Fruit Growers Express has placed 800, and the North Western Refrigerator Line 200 refrigerator cars. Northern Pacific is expected to place 500 underframes. Norfolk & Western will buy 20,000 tons of rails. The Pennsylvania has ordered the mechanical construction of 90 electric locomotives.

This seasonally large demand for structural material and pipe, and moderate expansion of railroad requirements, are in contrast with the further setback in automobile production. June output of passenger cars and trucks in the United States probably is falling short of 275,000 units, a 15 per cent decline from May.

With actual mill rates not yet affected by improved structural and pipe bookings, the steelmaking rate this week has declined almost 2 points to 36-37 per cent. While operations at Cleveland and Buffalo have expanded slightly, these gains are more than washed out by reductions in all other districts. It generally is thought the factors which have buoyed sentiment recently may level off the steelmaking rate more quickly than otherwise would have been the case, but they are not likely to provide an actual lift before August.

Firmness and weakness are about a standoff in the price situation. Makers of sheets proceed to contract on the new classifications, entailing some advances, although willing to ship through July on second quarter contracts. Strip manufacturers are making moderate progress in putting up their market $1 a ton. Prices of plates, shapes and bars are generally being extended into third quarter unchanged on the basis of 1.65c, Pittsburgh, with only moderate interest in contracting. Billets and slabs are down $1 a ton. Heavy melting steel scrap at Pittsburgh is off 50 cents to a low of $9.50, on a sale of 10,000 tons. Bolts and nuts are easier.

Steelmakers are slightly more hostile to the proposed advance in freight rates, realizing they might have to absorb up to $2 a ton.

STEEL's composite this week is off 4 cents to $30.99, owing to further weakness in galvanized sheets.

Composite Market Averages

Based on Pig Iron, Billets, Slabs, Sheet Bars, Wire Rods, Steel Bars, Plates, Shapes, Black, Galvanized and Blue Annealed Sheets, Tin Plate, Wire Nails and Black Pipe.

This week (June 24, 1931)	**$30.99**
Last week (June 17, 1931)	**31.03**
One month ago (May, 1931)	**31.37**
Three months ago (March, 1931)	**31.66**
One year ago (June, 1930)	**33.53**
Ten years ago (June, 1921)	**41.87**

Comparative Prices of Iron, Steel and Coke

Representative Market Figures for This Week, Last Month, Three Months and One Year Ago

	June 24, 1931	May 1931	March 1931	June 1930
PIG IRON				
Bessemer, del. Pittsburgh	$18.26	18.26	18.26	20.76
Basic, valley	17.00	17.00	16.75	18.50
Basic, eastern del. eastern Pa.	17.00	17.00	17.31	18.75
No. 2 foundry, del. Pittsburgh	18.26	18.26	18.01	19.76
No. 2 foundry, Chicago	17.50	17.50	17.50	18.40
*Southern No. 2, Birmingham	12.00	12.00	13.00	14.00
**No. 2X, Virginia furnace	18.25	18.25	18.25	18.25
**No. 2X, Eastern del., Phila.	17.75	17.76	18.26	20.26
Malleable, valley	17.00	17.00	17.00	19.00
Malleable, Chicago	17.50	17.50	17.50	18.40
Lake Superior, charcoal, del. Chi.	27.04	27.04	27.04	27.04
Gray forge, del. Pittsburgh	17.63	17.63	17.38	19.13
Ferromanganese, del. Pittsburgh	89.79	89.79	89.79	103.79

*1.75 to 2.25 silicon. For local delivery. Northern shipments based on $11, Birmingham. **2.25 to 2.75 silicon.

COKE				
Connellsville furnace, ovens	2.40	2.45	2.50	2.50
Connellsville foundry, ovens	3.25	3.25	3.25	3.50
SEMIFINISHED MATERIAL				
Sheet bars, open-hearth, Youngs.	29.00	29.75	30.00	31.25
Sheet bars, open-hearth, Pitts.	29.00	29.75	30.00	31.25
Billets, open-hearth, Pittsburgh	29.00	30.00	30.00	31.25
Wire rods, Pittsburgh	35.00	35.00	36.00	36.00

	June 24, 1931	May 1931	March 1931	June 1930
FINISHED MATERIAL				
Steel bars, Pittsburgh	1.65	1.65	1.65	1.75
Steel bars, Chicago	1.70	1.75	1.70	1.85
Steel bars, Philadelphia	1.94	1.94	1.94	2.04
Iron bars, Chicago	1.70	1.80	1.70	1.90
Shapes, Pittsburgh	1.65	1.65	1.60	1.70
Shapes, Philadelphia	1.76	1.76	1.81	1.66
Shapes, Chicago	1.70	1.75	1.70	1.80
Tank plates, Pittsburgh	1.65	1.65	1.65	1.70
Tank plates, Philadelphia	1.85½	1.85½	1.80½	1.85½
Tank plates, Chicago	1.70	1.75	1.70	1.80
Sheets, blue anl., No. 13, Pitts.	2.00	2.00	2.05	2.15
Sheets, black, No. 24, Pitts.	2.15	2.25	2.35	2.55
Sheets, gal., No. 24, Pittsburgh	2.75	2.80	2.90	3.20
Sheets, black, No. 24, Chicago	2.40	2.40	2.50	2.70
Sheets, blue anl., No. 13, Chicago	2.15	2.15	2.20	2.30
Sheets, galvanized, No. 24, Chi.	2.95	2.95	3.05	3.35
Plain wire, Pittsburgh	2.20	2.20	2.20	2.30
Wire nails, Pittsburgh	1.80	1.90	1.90	2.15
Tin plate, per base box, Pitts.	5.00	5.00	5.00	5.25
SCRAP				
Heavy melting steel, Pitts.	9.75	11.25	12.90	15.10
Heavy melting steel, eastern Pa.	8.00	9.50	10.50	13.28
Heavy melting steel, Chicago	8.50	8.65	9.75	12.05
No. 1 wrought, eastern Pa.	10.00	11.00	11.00	14.25
No. 1 wrought, Chicago	8.25	8.40	9.00	11.50
Rails for rolling, Chicago	10.50	11.15	12.00	14.55

Sheets

Few Orders Placed at New Prices—Shipments at Present Figures Extended Through July

SHEET PRICES, PAGE 49

Youngstown, O.—Prices under the new classifications have been announced by producers here as follows, all base, Pittsburgh: Nos. 9-10 hot-rolled (formerly blue annealed or strip-sheets) 1.70c; No. 24 hot-rolled annealed, 2.40c; Nos. 9-10 heavy cold-rolled, 2.35c; No. 20 cold-rolled, 2.95c; No. 10 furniture, 2.75c; No. 20 furniture, 3.25c; No. 20 autobody, 3.10c; and No. 24 galvanized, 2.90c. Sales at the former prices for delivery the remainder of this month are restricted, more attention being given to customers' needs under the new classifications. Operations are unchanged; some mills are planning to close during part of July.

New York—With most sellers quoting under the old classification up to July 1, on such shipments as may fall in July, the new prices continue largely nominal. The current market on black sheets is 2.15c to 2.25c, Pittsburgh; and on blue annealed 1.85c and 2.00c, Pittsburgh, subject to shading of $1 a ton. One large jobber has been offered 2.65c, Pittsburgh, on galvanized sheets. This is the lowest price yet reported in this district and is exceptional, the usual price to jobbers being 2.70c, Pittsburgh, with the general trade paying 2.75c to 2.80c.

Philadelphia—An eastern mill has announced 1.85c, Pittsburgh, for No. 10 blue annealed sheets for third quarter. This is in line with several other mills, but $1 a ton under the figure named recently by at least one important maker.

Pittsburgh—Sheet buyers are more interested in seeking contracts for third quarter, on which new prices are quoted. These prices include 2.40c for No. 10 gage hot-rolled sheets, comparable to the present black sheets and 2.90c for galvanized. Most contracts call only for moderate lots and the new quotations will not be provided a test for a number of weeks since buyers will be able to specify until June 30 at old prices for July shipment. Specifications are slightly more active, one interest reporting incoming business the best in seven weeks. On business for shipment over the remainder of this month producers continue old prices of 2.15c to 2.25c for black sheets, 2.00c and 1.85c for No. 13 gage and Nos. 9 and 10 gage of blue annealed, respectively, and 3.00c to 3.10c for autobody. Galvanized sheets usually are 2.80c, but 2.70c is becoming more prominent.

Cleveland—Two large contracts for the third quarter recently were negotiated at 2.40c, Pittsburgh, for hot-rolled annealed No. 24 gage. This represents the advance asked for that period. Interest generally has been on the upgrade, though actual sales generally are light. Occasional emergency orders are received from the Fisher Body Co.'s local plant. The large sheet inquiry from a barrel fabricator here has not been placed. It is understood this material is for use over the next quarter largely for drums for the Standard Oil Co. of New Jersey.

Under the new price classification sales will begin for all customers after June 30; shipments are not to be made later than July 31 under the old price basis. Empire Steel's sheet plant here will resume next week after being idle this week.

Chicago—Sheet mills are operating at about 40 per cent. Southwestern users are expected to order galvanized material early in August. Buyers are allowed to order material until July 1 on existing prices.

St. Louis—The market shows decided improvement, some users having covered well into the second half. No. 10 blue annealed sheets have been reduced from 2.25½c to 2.20½c, and No. 13 blue annealed from 2.40½c to 2.35½c delivered, St. Louis.

Current Finished Steel Prices

Prices in cents per pound unless otherwise stated

Steel Sheets

SHEET MILL BLACK, NO. 24

Pittsburgh, base	2.15c to 2.25c
Philadelphia, delivered	2.44c to 2.54c
Gary, Indiana Harbor	2.35c
Chicago, delivered	2.40c
Birmingham, base	2.40c
St. Louis, del.	2.60½c
San Francisco, c.i.f.	3.00c

TIN MILL BLACK, No. 28

Pittsburgh, base	2.55c to 2.65c
Gary, base	2.65c to 2.75c

GALVANIZED NO. 24

Pittsburgh, base	2.70c to 2.80c
Philadelphia, delivered	3.04c to 3.09c
Chicago, delivered	2.95c
Gary, Indiana Harbor	2.90c
Birmingham, base	2.95c to 3.05c
St. Louis, del.	3.15½c
San Francisco, c.i.f.	3.50c

BLUE ANNEALED SHEETS NO. 13

Pittsburgh, base	2.00c
Chicago, district mills	2.10c
Chicago, delivered	2.15c
St. Louis, delivered	2.35½c
Philadelphia, delivered	2.29c
Birmingham	2.15c to 2.20c

BLUE ANNEALED No. 9-10

Pittsburgh, base	1.85c
Chicago, district mills	1.95c
Chicago, delivered	2.00c
Philadelphia, delivered	2.14c
St. Louis, delivered	2.20½c
Birmingham	2.00c to 2.05c
San Francisco, c.i.f.	2.50c

AUTOMOBILE NO. 20

Pittsburgh, base	3.00c to 3.10c

FURNITURE

No. 10, heavy, Pittsburgh	2.75c
No. 20, light, Pittsburgh	3.35c

New Classifications, Pitts. base:

Heavy cold-rolled No. 10, 2.35c; cold-rolled No. 20, 2.95c; hot-rolled No. 10, 1.70c; hot-rolled No. 24, 2.40c to 2.50c. Differentials of 10 and 15 cents, respectively, at Gary, Ind., and Chicago, del.

Tin and Terne Plate

Prices per 100 pound box Pittsburgh

Tin plate, coke base	$5.00
Gary, Ind., base 10 cents higher.	
Long ternes, 24, unassorted, lb.	3.15c

Wire Products

(To Jobbers-Merchant Trade)

F.o.b. Pittsburgh, Cleveland base
(Per 100 pound keg)

Standard wire nails	$1.80-1.90, and 1.90
Cement coated nails	1.80-1.90, and 1.90
Galvanized nails	3.80-3.90, and 3.90

(Per pound)

Polished staples	2.35c and 2.45c
Galvanized staples	2.60c and 2.70c
Barbed wire, gal.	2.55c and 2.65c
Annealed fence wire	2.35c and 2.45c
Galvanized wire	2.80c and 2.90c

Woven wire fencing, retailers, Pittsburgh-Cleveland, net ton $65.

(To Manufacturing Trade)

Plain wire, 6-9 gage	2.20c
Spring wire	3.20c

Joliet, DeKalb, Waukegan, Ill., Anderson, Ind., Chicago, $1 over Pitts.-Cleve.; Duluth and Worcester, Mass., $2 higher; Fairfield, Ala., $3 higher.

Rivets

Struc. c.l., Pitts.-Cleve.	2.75c
Struc., c.l., Chicago	2.85c
7/16-in. smaller, Pitts.	70, 10 and 5 off
Chi., Cleve.	70 to 70, 10 and 5 off

Steel Plates

Base, Pittsburgh	1.65c
Philadelphia, del.	1.85½c
New York, delivered	1.93c
Boston, delivered	2.05c
Chicago, base	1.70c to 1.80c
Cleveland, delivered	1.83½c
Lackawanna, N. Y., base	1.75c to 1.80c
Birmingham, base	1.80c to 1.85c
Coatesville, Pa., base	1.75c
Pacific Coast, c.i.f	2.00c
St. Louis, del.	1.95½c

Structural Shapes

Base, Pittsburgh	1.65c
Philadelphia, del.	1.76c
New York, del.	1.85½c to 1.90½c
Boston, del.	1.98½c
Chicago, base	1.70c to 1.80c
Cleveland, delivered	1.83½c
Lackawanna, N. Y., base	1.75c to 1.80c
Birmingham base	1.80c to 1.85c
Pacific Coast, c.i.f.	2.05c to 2.15c

Bars

SOFT STEEL

Pittsburgh, base	1.65c
Chicago, base	1.70c to 1.80c
Birmingham base	1.80c to 1.85c
Lackawanna, N. Y., base	1.70c to 1.75c
Pacific Coast, c.i.f.	2.05c
Cleveland base, local del.	1.70c
Cleveland base, out. del.	1.65c
Philadelphia, del.	1.94c
New York, del.	1.98c
Boston, del.	2.05c
Pittsburgh, cold finish	1.85c
Pittsburgh, forg. qual.	1.90c

RAIL STEEL

Chicago Heights	1.60c
Eastern mills	1.50c to 1.55c
Pittsburgh	1.30c to 1.35c

IRON

Chicago, base	1.70c to 1.80c
New York, delivered	1.93c to 2.03c
Philadelphia, delivered	1.89c
Pittsburgh, refined	2.75c to 4.25c

REINFORCING

Pitts., billet cut lengths	1.90c
Stock lengths, mill	1.60c to 1.65c
Chi., billet	1.85c to 2.00c
Chi., rail steel	1.50c to 1.65c
Chi., rail steel, bridge and culvert	1.65c
Philadelphia, cut lengths	2.19c
Cleveland, cut lengths	1.95c to 2.05c

Cold Finished Steel Bars and Shafting

Base, Pittsburgh, Chicago, Buffalo and Cleveland	2.10c
Shafting, turned and ground, mill	2.45c to 2.90c

Corrosion, Heat Resist. Alloys

Base, Pittsburgh

18 per cent chrome, 8 per cent nickel
Sheets, 35c; plates, 31c; bars, 28c.

	A	B	C	D
Bars	19c	20.5c	23c	28c
Plates	21c	22.5c	25c	30c
Sheets	26c	27.5c	30c	35c
Hot strip	19c	20.5c	23c	28c
Cold strip	28c	29.5c	32c	37c

Carbon 0.12 and under; no nickel. A has chrome 15% and under, B over 15/18% inc., C over 18/23% inc., D over 23/30%.

Wrought Washers

Carloads, Pitts. dist.	$6.50 to $6.75 off
Carloads, Chicago dist.	6.70 to 6.80 off

Alloy Steel

Hot Rolled—F.o.b. Mills

Alloy Quality Bars, 2.65c, mill

S.A.E.	Alloy Diff.	S.A.E.	Alloy Diff.
2000	0.25	1.25-1.75 Ni.	1.05
2100	0.55	5100 .80 - 1.10 Cr.	0.45
2300	1.50	51.00 Cr. spring	0.20
2500	2.25	6100 bars	1.20
3100	0.55	6100 Spring	0.95
3200	1.35	Cr., Ni., Van.	1.50
3300	3.80	Carbon Van.	0.95
3400	3.80	9250 (flats)	0.25
4100 .15 to .25 Mo.	0.50	9250 (rds.,sq.)	0.50
4600 .20 to .30 Mo.			

Strip, Hoops Bands

Hot strip, to 6-in., Pitts.	1.60c to 1.65c
Do, 6 6/16 to 24-in., Pitts.	1.50c to 1.60c
Hot strip, bands 6 in. and under, Chicago	1.70c to 1.75c
Do. 6 1/16 to 24 in.	1.60c to 1.70c
Cooperage hoop, Pitts.	1.70c to 1.80c
Do, Chicago	2.00c to 2.10c
Cold rolled strip, Pitts., Cleve., 3 tons, over	2.15c to 2.25c
Worcester, 3 tons, over	2.40c

Rails, Track Material

Standard bess. and open hearth rails, mill	$43.00
Relay rails, Pitts., 20 to 45 lbs.	$22.00 to $26.00
50 to 75	20.00 to 24.00
80 to 100	24.00 to 27.00
Light rails, 25-45, mills	$34.00
Light rails, Chicago	$36.00
Angle bars, Chi. base	2.75c
Spikes, railroad, mills	2.70c
Spikes, railroad, 7/16-in. and smaller, Pitts.	2.70c
Spikes boat, barge, Pitts.	2.90c
Spikes, railroad, Chi.	2.80c
Track bolts, Pitts., steam roads	3.80c
Do. standard, jobbers	73 off list
Track bolts, Chicago	3.80c
Tie plate, mills	$39.00

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chi.
Discounts to legitimate jobbing or large consuming trade for full-case lots apply to May 10, 1930, lists.

CARRIAGE BOLTS

All sizes, cut thread ..... 73 and 10 off
Rolled thread ⅝ x 6 and smaller take 10 per cent lower list.
Eagle list ..... 73 and 10 off

MACHINE BOLTS

All sizes, cut thread, lag screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts, stud bolts without nuts ..... 73 and 10 off
Tire bolts, 60, 10 and 10 off.
Stove bolts, 80, 10, 10, 5 off in pkgs.; 80, 10, 5, 2½ off in bulk.
Rolled thread machine bolts, ⅝ x 6 and smaller take 10 per cent lower list.

NUTS

Semifinished ..... 73 and 10 off

HEXAGON CAP SCREWS

Milled ..... 80-10-10-5 off
Upset 1 in. diam. and smaller ..... 85-10 off

SQUARE HEAD SET SCREWS

Milled ..... 80-5 off
Upset 1 in. and smaller ..... 80-10-5 off
Upset, larger than 1 in. ..... 80-5 off

Cut Nails, Chain, Piling

Cut nails, c.l. Pittsburgh 2.50c
Do, less carloads, 5 kegs or over, 2.75c; less than 5 kegs 2.90c.
Chain, BB, BBB, 9/16-1½ in. ..... 33 1/3 off
Sheet piling, Pitts. 1.90c

Bars

Little Interest Shown in Third Quarter Needs—Price Being Reaffirmed—Production Is Light

BAR PRICES, PAGE 49

Chicago — Heavy deformed bar shipments constitute the leading activity in bar mill products, although bar mills at 40 to 45 per cent, now have less of promise than plate mills in backlogs. Inquiry for third quarter is negligible, but a few forward contracts have been closed at 1.70c base, Chicago. Competitive business is not of sufficient volume to affect prices seriously. Railroad shops take more bars and automotive parts makers this month are above the level of automotive production. Some implement and tractor works do not intend to resume until October. Others will not produce in volume at least about Jan. 1. Alloy bar mills are down to 35 to 40 per cent.

Philadelphia—Greater firmness is seen in steel bars at 1.65c, Pittsburgh, for carlots and this price is being generally reaffirmed for third quarter. Buying continues light.

Pittsburgh—Steel bar users are showing more interest in third quarter contracts and a number have been received at 1.65c, Pittsburgh. Buyers are willing to seek protection on future needs but show no increase in specifications against existing contracts and the market lacks a test on large orders. Shipments are fairly steady but are off slightly from the May rate.

Youngstown, O.—Opening of books by steel bar producers here for third quarter delivery at the unchanged flat price of 1.65c, Pittsburgh, has not brought buying. In fact, routine covering of third quarter needs with local mills has been mostly in small individual lots. Bar bookings in June promise to be even less in the aggregate than in May. However, 1.65c appears firmer today than it was several weeks ago.

Cleveland—In general, manifestation of interest among contract merchant steel bar users has shown a slight upturn this week as the third quarter approaches. Sales, however, continue toward the weak side in maintenance of the weekly totals that were established late in May and early June. The market remains quotably unchanged at 1.70c, locally, and 1.65c, outside, Cleveland base.

Chicago Firm Gets Tank

Washington—The Chicago Bridge & Iron Works has been awarded the contract for a gasoline tank for the department of yards and docks, at Hampton Roads, Va., on a bid of $3680. The same company was low on a tank for Parris Island, S. C., with a bid of $3980.

Cold-Finished Bar Interest Is Light

Cold Finished Prices, Page 49

Pittsburgh—Cold-finished bar producers are taking third-quarter contracts at former prices with the market continuing steady at 2.10c. Interest on the part of consumers in future requirements is light and specifications against old contracts are moderate. Both shipments and incoming business this month are smaller than the May period.

Cleveland—Though shipment of an occasional carload continues weekly for each seller, the past week has been marked by almost a total lack of carload inquiry. Specifications give promise of tapering to more in keeping with fresh interest. Third-quarter commitments are being taken at unchanged price, 2.10c, Cleveland.

Tin Plate Demand Slower; Contracts Being Renewed

Tin Plate Prices, Page

Pittsburgh—Tin plate activity continues to tend downward at a gradual rate with little change noted recently in specifications. Operations are slightly lower at 65 per cent. Large fruit packs are anticipated and the pea crop is expected to compare favorably with those of recent years. Contracts are being extended for the second half of the year with the market unchanged at $5, Pittsburgh, per base box.

Plates

Miscellaneous Orders in Good Volume—Tank Inquiry Larger —Eastern Mill Reaffirms Price

PLATE PRICES, PAGE 49

Chicago—About 4000 to 5000 tons of tank plate inquiry is out in Oklahoma City territory. While progress is noted in bringing the East Texas oil pool under control, the tank program for that area is being delayed because of financing difficulties encountered by some of the smaller operators. Plate mills, with pipe line orders extending through most of July, are in a better position as regards forward business than other heavy finished mills. Prices based on 1.70c, Chicago, are quoted, a few orders having been closed for third quarter for specific work. Recent additional pipe line orders have improved the plate mill outlook for the next 30 days.

New York—The Standard Oil Co. of New Jersey has closed on its second half plate requirements for domestic and Canadian plants. The Canadian order is for 5000 tons. The company continues to negotiate for its first half of 1932 domestic requirements. This is the first time in several years the company has come into the market for plates for a quarter or a half year ahead, indicating in the opinion of some sellers its belief prices now are at bottom.

Philadelphia—The Lukens Steel Co. has reaffirmed 1.75c, base, Coatesville, Pa., on carload plate shipments for third quarter. Although official action is pending in some instances, indications point to a general extension of this price. Possibility of early reductions in short haul rates is being considered in current negotiations. The Sun Oil Co. has placed seven tanks requiring about 250 tons of plates with the Downingtown Iron Works, East Downingtown, Pa. The Atlantic Refining Co., Philadelphia, is inquiring for 12 tanks for Pennsylvania and eastern Maryland, requiring 500 to 600 tons of plates.

Pittsburgh—Plate demand continues quiet. Prospective barge work is heavy, but considerable of this is expected to be deferred some time. Third quarter plate contracting is slightly more active with the market usually 1.65c, Pittsburgh.

Cleveland—Plate demand is ebbing. The past week for several sellers was the dullest of any this year or last. Several contracts for third quarter were closed last week at 1.65c, Pittsburgh. Sellers generally are not soliciting customer coverage. The local tank work for the Gulf Oil Co. requiring about 1100 tons, went to Riter-Conley Co. The Belvoir avenue water main will take approximately

1500 tons of plates and shapes. A state purchase the past week of a carload of plates uncovered prominent producers' bids of 1.65c, Pittsburgh, with the exception of one bidder who went to 1.60c. The 1.65c figure is indicative of the bulk of customer billing.

Contracts Placed

1100 tons, tanks, Cleveland, for Gulf Oil Co., to Riter-Conley Co., Pittsburgh.
1000 tons, pipe line dredge, for New York city, to Ellicott Co., Baltimore.
800 tons, two dredges, for United States engineers, Washington, to Marietta Mfg. Co., Marietta, O.
500 tons, 24 and 30-inch water pipe, Vancouver, B. C., to Vancouver Engineering Works Ltd. and Alcock, Downing & Wright, Vancouver.
250 tons, seven oil tanks for Sun Oil Co., to Downington Iron Works, East Downington, Pa.
200 tons, standpipe, Provincetown, Mass., to Pittsburgh-Des Moines Steel Co.
100 tons, sheet piling, Superior, Wis., for Valley Camp Coal Co., to Jones & Laughlin Steel Corp., Pittsburgh.

Contracts Pending

1500 tons, water main, Belvoir avenue, Cleveland.
500 tons, 12 tanks, for Atlantic Refining Co., Philadelphia.
Unstated tonnage, 300,000-gallon tank, constructing quartermaster, Maxwell Field, Montgomery, Ala.
Unstated tonnage, steam-drive, stern-wheel river dredge, for United States engineer, St. Louis.

Semifinished Easier; Slabs and Billets Down $1

Semifinished Prices, Page 60

Youngstown, O.—While semifinished steelmakers have opened books for third quarter, few sales have been made. The uneven operating rates of valley nonintegrated sheet and strip mills, is leading to less than the usual forward contracting. Since an important Cleveland interest is offering billets, sheet bars and slabs for third quarter at $29, Cleveland, it appears unlikely that the valley producers will quote higher.

Philadelphia—Better inquiry from forging shops is cheering billet sellers. The shops in this district now are operating at less than 20 per cent. Rerolling billets continue $29, Pittsburgh, and forging, $35.

Pittsburgh—Semifinished steel demand still is limited to small orders for early needs. Shipments are lighter than a month ago despite little change over the past several weeks. Prices lack a test, usually continuing $29 to $30, for rerolling billets, sheet bars and slabs, $35 to $36 for forging billets, and $35 for wire rods.

Cleveland—The market for sheet bars, billets and slabs is easier, the leading merchant producer now quoting $29 flat, Cleveland or Youngstown, O., on all three grades. Sheet bars have been $29, while $29 to $30 have been quoted on billets and slabs. Consumers are not closing specific contracts but continuing arrangement to take material at the going price when needed. Operations are unchanged, five of 14 open hearths continuing active at this merchant's plant.

Chicago—Semifinished steel shipments this month are higher than in May, due to the building up of stocks by several leading buyers in the open market. Forward contracting is light. Small billets and blooms, 4 x 4-inch base, now are $30 to $31, Chicago, while forging billets are $35 to $36. Sheet bars are $30, Chicago.

Railroads

Pennsylvania Awards 90 Engine Frames—Car Inquiry Livelier —800 Underframes Placed

TRACK MATERIAL PRICES, PAGE 49

New York—Placing of contracts for the mechanical construction of 90 electric locomotives by the Pennsylvania railroad and an inquiry for 20,000 tons of 130-pound rails for the Norfolk & Western feature the eastern railroad market.

The Pennsylvania award follows the recent placing of electrical parts for these locomotives at a cost of $16,000,000. Award of contracts for electrical equipment and mechanical construction in connection with 60 additional locomotives is contemplated.

Pennsylvania railroad is expected out shortly with third-quarter needs of track accessories. Norfolk & Western takes bids July 8 for its rail inquiry. This road used to inquire for about 40,000 tons at around this time of year. The Delaware, Lackawanna & Western is opening bids July 2 for its third-quarter requirements of nails and hot-rolled products.

Temporary collapse of the program for unifying the New York subway systems is expected to further delay action on 589 subways cars of which 300 for the Board of Transportation were expected out for figures late in June. The remaining 289 have long been pending for the Interborough Rapid Transit Co.

Chicago—Car equipment inquiry shows a little more life. Prospects are favorable for more repair and maintenance work in the event the proposed freight rate advance is approved. Two western car building shops are adding to their forces in preparation for the start of work on a few recent orders. Fruit Growers' Express has awarded 800 underframes, and St. Louis Car Co. is reported low bidder on 500 to 800 sugar cane cars for Porto Rico. Northern Pacific is expected to issue formal inquiry soon for 500 additional underframes.

Several miscellaneous rail orders, totaling about 1000 tons, have been placed, but no important inquiry is in sight. Rail releases recently have been averaging 5000 to 6000 tons weekly. Rail mills are expected to remain at 30 per cent operations at last until the early part of July, although shipments are likely to taper more rapidly from now on.

Car Orders Placed

Cleveland, Cincinnati, Chicago & St. Louis, two combination baggage and mail gasoline-electric rail motor cars, to J. G. Brill, Philadelphia.
Fruit Growers' Express, 800 refrigerator cars to own shops; underframes to Pressed Steel Car Co., Pittsburgh.
North Western Refrigerator line, 220 refrigerator cars, to American Car & Foundry Co., New York.

Locomotives Placed

Navy department, four to six helium tank cars for Lakehurst, N. J., bids postponed from June 16 to June 23.
Pennsylvania, mechanical construction of 90 electrical locomotives, 54 to be built by the Westinghouse Electric & Mfg. Co., at Eddystone, Pa.; 25 by the general Electric Co., at Erie, Pa.; and 11 at the company's own shops at Altonna, Pa.; as previously noted the electrical equipment was recently let; action on 60 additional electric locomotives is contemplated.

Car Orders Pending

American Railroad Co. of Porto Rico, 500 to 800 all-steel sugar cane care; bids asked through N. L. Soto, purchasing agent, Porto Rico; St. Louis Car Co., St. Louis, reported low bidder.
Northern Pacific railroad, 500 additional underframes; formal inquiry expected soon.

Rail Orders Pending

Board of Transportation, New York, several hundred tons, frogs and switches; Lorain Steel Co., Johnstown, Pa., low on one contract at $46,772; William J. Whapton Co. low on second at $42,950.
Norfolk & Western, 20,000 tons, 130-pound rails; bids opened July 8.

Structural Shapes

Henderson, Ky., Bridge Placed — Awards Better Than Average—Pending Total Swells at New York—Fresh Inquiry This Week Is 53,494 Tons

STRUCTURAL SHAPE PRICES, PAGE 49

New York—Structural steel inquiry continues to pile up encouragingly. Lettings have improved slightly, but the approaching maturity of several large jobs indicates a decided brace in New York territory late in the summer and early Fall. New Jersey state highway commission takes bids July 6 on 11,000 tons, in addition to 6100 tons June 29. Two bridges over Shelter Island sound will take approximately 6700 tons, expected to be let in late summer. Figures go in July 7 on substructures for these bridges. Boring contracts are about to be let on the West Side elevated from Twenty-second to Fifty-ninth street to be followed by general contracts, reviving 15,000 tons. Three 1100-foot docks in the midtown section, Manhattan, will come out in August, a $7,000,000 project which will take between 8000 and 10,000 tons. Fresh active inquiry includes several projects over 1000 tons each. Prices on plain material are steadier with less shading of 1.855c, New York.

Boston—More than 1600 tons was contracted for in the past week. Most of this was for bridges in various parts of New England. The major item was for 980 tons in the bridge at Wiscasset, Me., which went to the American Bridge Co. About 650 tons more are actively pending.

Worcester, Mass—Structural lettings remain relatively quiet, contract for 500 tons for the Worcester county tuberculosis hospital, going this week. Worcester memorial auditorium, 2000 tons, and the Worcester art museum, 300 tons, should be let soon.

Philadelphia—Pending formal declaration of third-quarter prices by most eastern mills, 1.70c, eastern mill, is the usual carload price for shapes. Indications are this figure may be extended. Awards are light though fair inquiry prevails. American Bridge Co. will erect the Thirtieth street station, having already the fabrication contract for 19,000 tons.

Pittsburgh—Outstanding in the week's shape awards is the bridge for the Louisville & Nashville railroad to be built across the Ohio river at Henderson, Ky., involving 20,585 tons. A bridge for the Chesapeake & Ohio railroad, requiring 900 tons, to be built at Ft. Springs, W. Va., also has been placed. Plain structural shapes are being continued into third quarter at 1.65c, Pittsburgh, but contracting is slow.

Cleveland—The largest tonnage in some time, 2000 tons for the Addressograph Co. plant, has been placed with the Pittsburgh Bridge & Iron Works, Rochester, Pa. However, with the exception of small industrial building and remodeling work to keep some fabricators busy, nothing of consequence in large lots has been placed. W. F. Hendrich Co., Cleveland, will buy 400 tons of shapes for an armory, Syracuse, N. Y. Plain material is generally 1.65c, Pittsburgh, but firmness is not manifest in fabricated prices.

Chicago—Structural activity is fair, but fabricators are spreading plain material specifications along as needed. Inquiry is lighter at about 3500 tons. The Thirty-fifth street viaduct, Milwaukee, 7500 tons, is out for figures. About $3,000,000 in harbor improvements will be expended at Milwaukee, including several thousand tons of structurals, sheets, plates and piling. Plain material is usually 1.70c, Chicago, the 1.80c price applying only in mixed carloads.

Contracts Placed

20,585 tons, bridge, Henderson, Ky., for Louisville & Nashville railroad; 20,385 tons to American Bridge Co., Pittsburgh; 200 tons girder spans, to Virginia Bridge & Iron Co., Roanoke, Va.

2400 tons, highway bridge, Illinois, to Clinton Bridge Works, Clinton, Iowa, and International Steel & Iron Co. Inc., Evansville, Ind.

2080 tons, Southern State railway, Persia, to McClintic-Marshall Corp., Bethlehem, Pa.

2000 tons, plant, Euclid, O., for American Multigraph Co., to Pittsburgh Bridge & Iron Co., Rochester, Pa., through H. K. Ferguson Co., Cleveland, general contractor.

1000 tons, additional, 48-story bank and office building, 30-40 Broad street, New York, to American Bridge Co., Pittsburgh; reported as 6000 tons in STEEL last week; Thompson Starrett Co., contractors.

1000 tons, wharf unit No. 3, Lake Charles, La., to unstated company.

980 tons, bridge, Wiscasset, Me., to American Bridge Co., Pittsburgh.

900 tons, bridge, Ft. Springs, W. Va., for Chesapeake & Ohio railroad, to American Bridge Co., Pittsburgh.

880 tons, water tanks, Lancaster, Pa., to McClintic-Marshall Corp., Bethlehem, Pa.

581 tons, bridge, route 4 (1917), Deal Lake, N. J., to McClintic-Marshall Corp., Bethlehem, Pa.; Whittaker & Diehl Co., Harrisburg, Pa., contractor; noted last week as 500 tons. 75 tons concrete bars placed with Harrisburg distributor.

500 tons, tuberculosis hospital, Worcester, Mass., to Eastern Bridge & Structural Co., Worcester.

500 tons, building, City hospital, Boston, to Palmer Steel Co., Springfield, Mass.

475 tons, armory, Newburg, N. Y., to McClintic-Marshall Corp., Bethlehem, Pa.; Miller & Gaynor Co., Poughkeepsie, N. Y., general contractor.

450 tons, hotel, Bermuda, to unstated fabricator, through John W. Ferguson, Paterson, N. J., contractor.

438 tons, ribs for tunnel subway route 106, section 7, New York, to McClintic-Marshall Corp., Bethlehem, Pa.

427 tons, bridges for New York state, to Lackawanna Steel Construction Co., Buffalo; state letting of June 9.

400 tons, bridge, New York Central railroad, Savannah, N. Y., to McClintic-Marshall Corp., Bethlehem, Pa.

350 tons, highway bridge, Gratz, Ky., to Vincennes Bridge Co., Vincennes, Ind.

349 tons, grade crossing elimination, Cobbleskill, N. Y., to McClintic-Marshall Corp., Bethlehem, Pa.

304 tons, H columns, bridge over Santa Clara river; Ventura county, Calif.; to unreported company.

260 tons, grade crossing, Purdy's Crossing, N. Y., for New York Central railroad, to Harris Structural Steel Co., New York, through Bates & Rogers Construction Co.

250 tons, store, Sault Ste. Marie, Ont., for T. Eaton Co. Ltd., Toronto, Ont., to Hamilton Bridge Co., Hamilton, Ont.

250 tons, state highway bridges, Maine, to Pittsburgh-Des Moines Steel Co.

230 tons, stand pipe, Provincetown, Mass., to Pittsburgh-Des Moines Steel Co., Pittsburgh.

217 tons, station, Jenkintown, Pa., for Reading railroad, to Frank M. Weaver & Co., Lansdale, Pa.

207 tons, bridge, Cayuta, N. Y., for Lehigh Valley railroad, to McClintic-Marshall Corp., Bethlehem, Pa.

175 tons, addition, office building, Sixth avenue and Forty-fourth street, New York, to Harris Structural Steel Co.

170 tons, parochial school, Church of Good Shepard, Brooklyn, N. Y., to George A. Just Co., Brooklyn; Wil-

Awards Compared

	Tons
Awrds this week	**40,140**
Awards last week*	**21,724**
Awards two weeks ago	**61,284**
Awards this week in 1930	**41,304**
Av. weekly awards, 1930	**35,242**
Av. weekly awards, 1931	**37,129**
Av. weekly awards, May	**23,457**
Total awards to date, 1930	**901,098**
Total awards to date, 1931*	**1,002,447**

***Revised.**

liam T. O'Reilly Co., contractor.

170 tons, state bridge, Bartlett, N. H., to Kittridge Bridge Co., Concord, N. H..

165 tons, staff house, Essex Mountain sanitarium, Verona, N. J., to H. R. Goeller Inc., Hillside, N. J.; Eastern Building Co. Inc., Newark, N. J., general contractor.

165 tons, hangar, Newark airport, N. J., to Oltmer Iron Works, Hoboken, N. J., state project, separate steel contract.

150 tons, state highway bridge, New York, to American Bridge Co., Pittsburgh.

150 tons, shapes and bars, school, Jamesburg, N. J., to Goethal Steel Co., Elizabeth, N. J., and Macomber Steel Co., Canton, O.; John N. Wester, Metuchen, N. J., contractor.

147 tons, Epp apartments, San Francisco, to Herrick Iron Works, Oakland, Calif.

143 tons, state bridge, Palmyra, Me., to Pan American Bridge Co., Newcastle, Ind.

142 tons, bridges, Passaic, N. J., for New Jersey state highway commission, to Belmont Iron Works, Philadelphia.

137 tons, two contracts, Delaware, Lackawanna & Western railroad, (72) Chenango Forks, N. Y., (65) Bergen Junction, N. J., to American Bridge Co., Pittsburgh.

122 tons, Grasslands hospital, Valhalla, N. Y., to McClintic-Marshall Corp., Bethlehem, Pa.

120 tons, Wilson avenue school addition, Los Angeles, to Consolidated Steel Corps., Los Angeles.

115 tons, theater, Alameda, Calif., to Golden Gate Iron Works, San Francisco.

110 tons, Howard terminal, Oakland, Calif., to Moore Drydock Co., Oakland.

110 tons, apartment, St. Johns place, Brooklyn, N. Y., to Kalder Iron Works, New York.

110 tons, bank, Flatbush avenue, Brooklyn, to George A. Just Co., Brooklyn, N. Y.

110 tons, school addition, St. Patrick's church, Ninety-fifth street and Fourth avenue, Brooklyn, N. Y., to Lehigh Structural Steel Co., Allentown, Pa., through Sobray Whitcomb Co.

103 tons, bridge No. 3282 for Boston & Maine railroad, Croton, N. Y., to Shoemaker Bridge Co., Pottstown, Pa.

100 tons, bridge, Darby, Pa., to American Bridge Co., Pittsburgh.

100 tons, state bridge, Hinsdale, Mass., to Boston Bridge Co., Boston.

100 tons, apartment, Morris avenue and 176th street, Bronx, N. Y., to D. & R. Iron Works, Bronx.

100 tons, nurses' home, Good Brother island, New York, to Oak Point Iron Works, Bronx, N. Y.; Mercury Construction Co., contractor.

100 tons, domestic service building, training school, Washington, D. C., to Ingalls Iron Works, Verona, Pa.; A. L. Goode Inc., Charlotte, N. C.; general contractor.

100 tons, torpedo racks, building No. 24, Melville, R. I., department yards and docks, to Berlin Construction Co., Berlin, Conn.

100 tons, addition to Paraffine Companies plant, Oakland, Calif., to Moore Drydock Co., Oakland.

100 tons, mess hall, San Quentin, Calif., state prison, to Golden Gate Iron Works, San Francisco.

100 tons, shop for Junior sollege, Pasadena, Calif., to McClintic-Marshall Corp., Bethlehem, Pa.

100 tons, bank, Holister, Calif., to Schrader Iron Works, San Francisco.

Contracts Pending

106,800 tons, Golden Gate bridge, San Francisco; 72,000 tons, main span and towers, McClintic-Marshall Corp., Bethlehem, Pa., low; 28,000 tons, steel cable, American Cable Co., New York, low; 6800 tons, approach spans, Columbia Steel Co., San Francisco, low.

11,000 tons, structural steel, 310 tons steel castings, 5175 linear feet struc-

(*Concluded on Page 77*)

Concrete Bars

Fair to Steady Volume of Small Orders—Long Island Bridges Pending — Illinois Will Distribute 2600 Tons—Fresh Pending Total 12,861 Tons—Awards 6670 Tons

REINFORCING BAR PRICES, PAGE 49

New York—Bridges over Shelter Island sound, Long Island, will take approximately 600 tons of reinforcing bars, about 200 tons for substructures, bids on which go in July 7. Lettings on several large New York city sewers are being made, including 650 tons for one section in the Sheepshead Bay district. Prices are steadier, even the larger contracts on which bulk of shading has prevailed in the recent past.

Boston—Only business done by concrete bar makers in the past week was for small projects, of which about 150 tons was placed.

Philadelphia—Market is 1.55c to 1.60c, subject to $1 a ton concession. Reinforcing bar inquiry is active, with electrification work for the Pennsylvania railroad on its Wilmington, Del., to Washington branch taking 1700 tons. Fresh inquiry this week totals 3550 tons.

Pittsburgh—A fairly steady volume of small orders for reinforcing bars holds demand at a relatively high rate. Activity in large lots is lacking here. Prices are being continued in the third quarter at 1.60c to 1.65c for stock lengths and 1.90c for cut lengths.

Cleveland—Culvert work for the Belvoir boulevard development will take about 700 tons of reinforcing steel. Awards locally are more numerous with Truscon Steel Co. taking the Wickliffe bridge and city hospital. A letting of bridge and paving work is anticipated on June 30 that will take a sizeable quantity of small lots of steel. Several concrete bridges for the state went in June 19.

Chicago—Less business is in sight after this month and early July. Rail steel bars for road work are easier at 1.50c, while bars for bridge and culvert work also are down $1 to $2, being quoted at 1.65c. About 2600 tons of Illinois road work from the June 15 letting will be distributed soon.

Awards Compared

	Tons
Awards this week	**6,670**
Awards last week	**3,885**
Awards two weeks ago	**6,645**
Awards this week in 1930	**6,162**
Av. weekly awards, 1930	**6,990**
Av. weekly awards, 1931	**6,771**
Av. weekly awards, May	**8,131**
Total awards to date 1930	**185,681**
Total awards to date, 1931	**182,824**

Contracts Placed

1200 tons, postoffice, Kansas City, Mo., to Concrete Engineering Co., Pittsburgh, through Ring Construction Co., Milwaukee, general contractor.

700 tons, buildings for veterans' hospital, Canandaigua, N. Y., to Olney J. Dean & Co., Chicago.

650 tons, storm sewers, Shore road, Sheepshead bay section, Brooklyn, N. Y., to Igoe Bros., Newark, N. J.; Alvin Construction Co., general contractor.

420 tons, Sloat boulevard viaduct, San Francisco, to W. S. Wetenhall Co., San Francisco.

350 tons, sewer, Bronx, N. Y., to Concrete Steel Co., Pittsburgh, through Nadbrum Construction Co.

300 tons, Illinois highway work, to Calumet Steel Co., Chicago.

265 tons, postoffice, Warren, Pa., to Kalman Steel Co., Chicago.

255 tons, postoffice, Fremont, O., to Kalman Steel Co., Chicago, through Rosen & Fischel, Chicago.

250 tons, church, Funston avenue, San Francisco, to Gunn, Carle & Co., San Francisco.

245 tons, viaduct over Northern Railroad of New Jersey, Englewood, N. J., to McClintic-Marshall Corp., Bethlehem, Pa., through F. E. Baker, contractor.

240 tons, highway work, Colusa county, Calif., to unstated company.

215 tons, mesh, highway, Londonderry, N. H., to American Steel & Wire Co., Chicago, through Amos D. Bridges Sons Inc., Hazardville, Conn., contractor.

200 tons, hospital and utility building, Fort Bragg, N. C., to Truscon Steel Co., Youngstown, O., through W. P.

(*Concluded on Page 57*)

Strip

Some Contracts at New Prices Being Booked Though Not Yet Tested on Large Lots

STRIP PRICES, PAGE 49

Pittsburgh—Although the $1 a ton advance on third quarter hot strip orders has not been thoroughly tested, producers are receiving some contracts for that period at new prices of 1.55c and 1.65c. Automotive interests as yet have not placed any large tonnage for that period. Cold-rolled strip continues 2.15c to 2.25c. Incoming business and shipments are quiet, both being smaller than a month ago. The moderation in demand partly reflects quiet in the automotive industry, although requirements of other consumers show a greater decrease. Hot strip production continues 25 to 30 per cent with cold strip output 20 to 25.

Philadelphia—Hot-rolled strip is currently 1.50c and 1.60c, Pittsburgh, with producers striving to make the official price $1 higher, effective with the turn of the quarter.

Youngstown, O.—Moving toward expiration date of strip sales under the old system and the inauguration of the classification system of strip and sheets July 1, local mills have joined with other leading makers in announcing prices to their customers. Under the circumstances purchases of strip are diminishing in volume. This applies as well to cold-rolled as hot-rolled. Auto partsmakers are also slowing their demand, which further operates to cut down valley strip mill activities this week to about 45 to 55 per cent.

Cleveland—Billings by strip makers have fallen off perceptibly in June. However, more inquiry for third-quarter requirements from customers gives expectation of the advance of $1 a ton on hot holding. Quotations on all new business are 1.55c for wide and 1.65c for narrow. On what business has been placed firmness is evident at these figures. Well-informed interests in the strip market have stated that no concessions are developing thus far, in itself an encouraging factor to price stability. Cold-rolled strip is quiet and unchanged at 2.15c to 2.25c, Cleveland.

Welded Pipe Is Bought

New Orleans,—Harry Bros. Co. of Louisiana has been awarded 533 lengths of welded steel pipe for the United States engineer here on a bid of $6897.02. Welded Steel Products Co. has booked 18 lengths steel pontoon pipe at $811.40.

Operations Down Over a Point to 36-37 Per Cent

Steel production this week has eased slightly to fractionally under 36-37 per cent. Major producing centers—Chicago, Pittsburgh, Youngstown, O., and Eastern Pennsylvania—have accounted for this recession. Buffalo and Cleveland made slight gains.

Youngstown, O.—Ingot operations are off one point this week to 41 per cent capacity. Republic Steel operations are off five points to 40; Carnegie Steel activity declined slightly and is at the same level; Sheet & Tube operations are up seven points to 40; Sharon Steel Hoop figure is 50 per cent.

Philadelphia—Eastern ingot operations are down a point and a half this week to 34 per cent of capacity for weighted average of all plants.

Buffalo—Operations here jumped six points the past week to 46 per cent, with prospect of continuance at or near that rate until the end of the month. There are 17 open hearths now in operation of 37 in the district.

Pittsburgh—Ingot production still is at slightly under 40 per cent tending downward a point from last week while finishing mill operations generally are unchanged. Seventeen out of 54 steelworks blast furnace stacks are on. Sheet output holds around 35, tin plate at 65 per cent. Strip continues 25 to 30, with pipe unchanged at 35 to 40 per cent.

Cleveland—After dipping to the 38 per cent level, the low for 1931, raw steel production snapped back this week three points to 41 per cent capacity. Fourteen of 34 open hearths are on. Otis Steel Co. has resumed with two open hearths pouring.

Birmingham, Ala—Steel operations are down five points this week to 45 per cent capacity. Nine to eleven open-hearth furnaces are kept producing off and on.

Chicago—Ingot production now is 35 to 37 per cent, against about 39 per cent a week ago. Steelworks blast furnace operations have been reduced by the banking of a furnace at South Chicago, but this has had little effect on ingot output because of the heavier amount of scrap used. The leading interest now has four furnaces banked. Eleven of the district's 36 steelworks blast furnaces are active. Finishing mill averages are down to slightly above 40 per cent.

Warehouse Sales Vary, But Hold May's Rate

Warehouse Prices, Page 71

New York—While orders for steel out of warehouse fluctuate from day to day, total volume holds to the rate of recent weeks. Prices on cold-finished material are relatively firmer than the general list.

Philadelphia—Jobbers have not yet adopted the new classification schedules on steel sheets. While some regard the action as imminent, others believe it will be deferred. Rate of business is slightly under last month. Prices are unchanged.

Buffalo—Effects of an approaching holiday are seen in diminishing warehouse demand. However, business has held up well in comparison with late May averages.

Pittsburgh—Sales are fairly steady but lack improvement. Some products are moving slightly better than in May. No additional price revisions are anticipated.

Cleveland—Current sales show little deviation from the recent rate. Good reception has generally been accorded the new quantity differential plan with more customers specifying in 1000-pound lots than previously. Cold-finished rounds and hexagons have been cut to 3.10c, with the usual 50 cents up from the new base applying for flats and squares. The 2300 and 3100 series in alloy bars have been reduced $10 a ton.

Cincinnati—Effect of reduced base prices on warehouse materials has not been noted as yet in volume, which still is on a restricted rate. Business is diversified but orders are light.

Detroit—Warehouses expect to benefit moderately as tool and die manufacturers swing into their work shortly on 1932 models. Warehouse business in general shows a slight decline both in number of orders and total volume, but the shrinkage seems less pronounced. Prices are unchanged and steady.

St. Louis—Business is extremely quiet, more than the usual seasonal recession in demand having taken place since June 1. Effective June 15 steel bars were cut to 3.00c; iron bars to 3.00c; No. 24 black to 3.80c, and No. 24 galvanized to 4.35c.

Concrete Bars

(*Concluded from Page 53*)

Rose Co., Goldsboro, N. C., contractor.

160 tons, bridge, route 108, Heidelberg borough, Allegheny county, Pa., state highway commission, Harrisburg, to Electric Welding Co., Pittsburgh; M. E. Lutz, Canton, O., general contractor.

150 tons, roadwork, Illinois, to Olney J. Dean & Co., Chicago.

150 tons, roadwork, Illinois, to Concrete Steel Co., Pittsburgh.

150 tons, roadwork, Illinois, to Kalman Steel Co., Chicago.

150 tons, overcrossings, Delaware, Lackawanna & Western railroad, Whitney Point and Chenango Forks, N. Y., to McClintic-Marshall Corp., Bethlehem, Pa.; Parker & Graham Inc., New York, contractor.

120 tons, city hospital, Cleveland, to Truscon Steel Co., Youngstown, O., through Crowell & Little, general contractors.

100 tons, bridge, Wickliffe-Madison road, Lake county, Ohio, for state of Ohio, to Truscon Steel Co., Youngstown, O.

100 tons, warehouse for Braun Corp., Los Angeles, to unstated company.

100 tons, apartment, Fernwood street, Los Angeles, to unstated company.

100 tons, apartment, LaFayette park place, Los Angeles, to unstated company.

100 tons, addition, Sylvania Industrial Corp. plant, Fredericksburg, Va., to Taylor-Davis Co., Philadelphia; Hughes-Foulkrod Co., general contractor.

Contracts Pending

19,000 square feet, weld steel fabric, for Picatinny arsenal, N. J.; bids taken June 23.

2658 tons, Golden Gate bridge, San Francisco; bids received.

1900 tons, Madden dam, Panama; United States government to furnish most of the material; bids Sept. 1.

1700 tons, electrification work between Wilmington, Del., and Washington for Pennsylvania railroad.

1000 tons, bridge over Ohio river, Henderson, Ky., for Louisville & Nashville railroad; Whiting Turner Construction Co., Baltimore, closing bids.

700 tons, culvert work, Belvoir boulevard, Cleveland; bids by Cuyahoga county.

625 tons, veterans' hospital buildings, Albuquerque, N. Mex.; Murch Bros. Construction Co., St. Louis, general contractor.

600 tons, two bridges, Shelter Island sound, Long Island, N. Y., requirements for substructures and superstructures; bids on former July 7, Robinson & Steinman, New York, engineers.

450 tons, Kline island sewage project, Allentown, Pa.; Pitt Construction Co., Pittsburgh, general contractor.

400 tons, sewage treatment plant, Elizabeth, N. J.

400 tons, Marshall Field estate building, Chicago.

367 tons, bridges, state of Ohio, includes bridges at the following points: 82 tons, Franklin county; 62 tons, near Wooster, O.; 40 tons, over Portage river; 25 tons, Robinson run; 35 tons, Huron river; 55 tons, Hamilton county; 27 tons, Highland county; 20 tons, each, Crawford and Butler counties; bids go in June 30; O. W. Merrill, state highway director.

300 tons, grade crossing work, Chestnut Hill, Pa., for Reading railroad.

250 tons, bridge and wall, Newark, N. J.

200 tons, highway route 8, section 7; New Jersey; bids July 8, board of freeholders, Warren county, Belvidere, N. J.

185 tons, highway, route 31, section 9, Andover to Newton, Sussex county; bids July 7, Freeholders room, County Administration building, Newton, N. J.; Norman B. Anderson, clerk. Work also includes four small-span stream bridges.

170 tons, highway, route 10, section 2, Passaic river to Roosevelt avenue, Morris and Essex counties, N. J.; bids July 6, New Jersey state highway comission, Trenton, N. J.; A. Lee Grover, chief clerk. Work also includes 104-foot span bridge over Passaic river, one 82-foot bridge over Whippany river and one small span bridge.

150 tons, theater, Alameda, Calif.; bids being taken.

150 tons, newspaper plant building, Rockford, Ill.; bids in.

120 tons, Erie railroad station, Jamestown, N. Y.; bids to be received by railroad.

119 tons, sewage disposal plants, North Chicago and Lake Forest, Ill.

114 tons, sewage disposal plant, Highland Park, Ill.

103 tons, two bridges, Ohio; 46 tons, bridge over Ashtabula river near Kingsville, O., and 57 tons, bridge over Bean creek, Burlington, O.; bids opened June 19, department of highways; O. W. Merrill, state highway director.

100 tons, reservoir, Newark, N. J.

Unstated tonnage, Cook county, Ill., nurses' home addition.

Pipe

Four Steel Pipe Awards Total 66,500 Tons—5500 Tons Cast in Two Eastern Cast Lettings

PIPE PRICES, PAGE 71

Pittsburgh—Two large line pipe tonnages have been placed in this and the valley districts. Youngstown Sheet & Tube Co., Youngstown, O., has taken 41,000 tons of 26-inch steel pipe for an Illinois gas line; locally the Jones & Laughlin Steel Corp. has booked 17,000 tons of 10¾-inch seamless for the Shell Union Oil Corp. Phoenix Utilities Co. has placed a total of 8000 tons with various makers. Sentiment in the market is moderately improved. Closing on other pending projects is deferred Lycoming Natural Gas Co. line is expected to be placed shortly while the Shamrock Oil & Gas Co. is expected in the market soon for 225 miles of 12½-inch for a line from East Texas to Houston, Tex.

New York—Department of water supply, gas and electricity, through contractors, is inquiring for 1900 tons of cast pipe, bids June 30. In addition, close to 600 tons for New York boroughs pend. United States Pipe & Foundry Co. booked 3500 tons for Lancaster, Pa., and close to 2000 tons for Parkersburg, W. Va. A small lot of centrifugal pipe for Newburgh, N. Y., went to R. D. Wood & Co. Bids are in on 7000 feet, various sizes, for Panama. Utilities, having bought lightly during first half, are expected in the market early in July for fill-in second half pipe. Prices still are weak.

Irak Petroleum Co., comprising American, French and British interests, has placed contracts for pipe amounting to $13,650,000 for a line from the Tigris river to the Mediterranean. This inquiry was noted in STEEL for January 22, 1931 as involving possibly 160,000 to 180,000 tons.

Cleveland—New business is slow developing for merchant pipe. Jobbers' commitments are featureless and generally small. Line tonnages are conspicuously absent in award through local mill representatives.

Chicago—Several Illinois sewage disposal projects and a number of carload contractors' orders constitute the chief demand in the cast pressure pipe market. Seasonal declines are aggravated by lack of available tax funds at a number of North Central points. Carload orders for 6-inch and over are based on $35 to $36, Birmingham.

Birmingham, Ala.—New business is light. Production is under 50 per cent of capacity. Bids are in on only small lots. Base price is unchanged at $35 to $36, 6-inch and over sizes.

Cast Pipe Placed

3500 tons, various sizes, water main extension, Lancaster, Pa., to United States Pipe & Foundry Co., East Burlington, N. J.; Angelo Lucenti, Pittsburgh, general contractor.

2200 feet, 30-inch at $13,244; 650 feet, 24-inch class C at $2593.50, for Madison, Wis., to United States Pipe & Foundry Co., Burlington, N. J.

2000 tons, 6 to 12-inch, class C, bell and spigot with fittings, Parkersburg, W. Va., to United States Pipe & Foundry Co., East Burlington, N. J.; Mountain Iron & Supply Co., Parkersburg, awarded gate valves at $22,529.

1500 tons, mostly 20-inch water main, Westchester county, N. Y., to R. D. Wood Co., Philadelphia.

885 tons, up to 20-inch, Frederick, Md., to United States Pipe & Foundry Co., East Burlington, N. J.

850 tons, 6, 8 and 10-inch, Schroon

NATIONAL
Copper-Steel Pipe

THE extra durability of NATIONAL Copper-Steel Pipe has thoroughly demonstrated this the logical and economical choice for piping exposed to atmospheric corrosion or wherever alternate wet and dry conditions prevail. Nearly twenty years of actual tests and service records prove the saving made due to minimized corrosion is proportionately far greater than the small additional investment. Ask for Bulletin 11—describing NATIONAL Copper-Steel Pipe—

The Original Copper-Steel Pipe

NATIONAL TUBE COMPANY

Frick Building, Pittsburgh, Pa.

SUBSIDIARY OF UNITED STATES STEEL CORPORATION

PRINCIPAL SUBSIDIARY MANUFACTURING COMPANIES

American Bridge Company
American Sheet and Tin Plate Company
American Steel and Wire Company
Carnegie Steel Company
Columbia Steel Company
Cyclone Fence Company
Federal Shipbuilding and Dry Dock Company
Illinois Steel Company
Minnesota Steel Company
National Tube Company
Oil Well Supply Company
The Lorain Steel Company
Tennessee Coal, Iron & R. R. Company
Universal Atlas Cement Company

Pacific Coast Distributors—Columbia Steel Company, Russ Building, San Francisco, Calif. *Export Distributors*—United States Steel Products Company, 30 Church Street, New York, N. Y.

Lake, N. Y., to R. D. Wood Co., Philadelphia.

600 tons, various sizes, Hartford, Conn., to American Cast Iron Pipe Co., Birmingham, Ala.

300 tons, 6 to 20-inch, Jersey City, N. J., to United States Pipe & Foundry Co., East Burlington, N. J.

270 tons, 16-inch, class 150, San Pedro sewer, Los Angeles, to unstated company.

170 tons, 24-inch, for Akron, O., to American Cast Iron Pipe Co., Birmingham, Ala.

Steel Pipe Placed

41,000 tons, 26-inch, gas line, Illinois, for unstated Illinois utility company to Youngstown Sheet & Tube Co., Youngstown, O.

17,000 tons, 200 miles, 10¾-inch seamless pipe for Shell Union Oil Corp., to Jones & Laughlin Steel Corp., Pittsburgh.

5500 tons, 14-inch seamless, for Phoenix Utility Co., to National Tube Co., Pittsburgh. Line is for Susquehanna Gas Co.; installation in Pennsylvania.

Several thousand tons, for Phoenix Utility Co. further distributory lines, Montana, among National Tube Co., Pittsburgh; Republic Steel Corp., Youngstown, O.; Jones & Laughlin Steel Corp., Pittsburgh; and A. O. Smith Corp., Milwaukee.

Cast Pipe Pending

7000 feet, various sizes, mostly small, for Panama; bids in.

2365 tons, 2 to 8-inch class B or 150, Oakland, Calif.; bids July 8.

2096 tons, 4 to 12-inch class B, San Francisco; bids June 29.

1300 tons, mostly 20-inch, Queens, N. Y.; bids June 30.

968 tons, 2 to 12-inch, class B, sewer and water system for Boulder City, Nev.; bids June 30 by United States bureau of reclamation.

810 tons, 20-inch class 250, San Bernardino, Calif.; bids June 23.

600 tons, 6, 8 and 12-inch, Brooklyn, N. Y.; bids June 30.

450 tons, miscellaneous sizes, Aurora, Ill., sewage disposal work.

400 tons, sewage disposal plant, Allentown, Pa.; bids in.

225 tons, various sizes with fittings, Bronx, N. Y.; bids in.

233 tons, 6 to 18-inch, class B for centrifugal, Burbank, Calif.; bids received.

208 tons, 2 to 12-inch class 150, Fairfield, Calif.; bids received.

150 tons, miscellaneous sizes, Highland Park and Lake Forest, Ill., sewage disposal projects.

Steel Pipe Pending

3000 tons, 60-inch steel pipe, department of water supply, New York, specifications expected out in two months; this was previously listed as cast pipe.

2700 linear feet, steel pipe and fittings, various sizes, for Mitchell Field, Long Island, N. Y.; John Maneely Co., Philadelphia, low on pipe; Walworth Co., New York, and Harry Beroza, Hempstead, N. Y., low on fittings.

2100 tons, 48-inch, for department of water supply, New York; A. Gregoria & Co., low on general contract.

708 tons, including 355 tons, small steel pipe and fittings; 353 tons, large metal conduits, Madden dam, Panama; United States government to furnish most of material; bids Sept. 1.

Wire

Summer Dullness Rules Market —Little Third Quarter Material Bought—Prices Are Mixed

WIRE PRICES, PAGE 49

Chicago—Inquiries are almost entirely lacking in forward commitments for wire products. Practically no sales have been made for third quarter. Quotations are $1.85 to $1.95, Chicago or western mills, for wire nails, and 2.25c for plain wire. It is indicated seasonal declines in merchant wire products are completed, as specifications seem to have leveled off. Jobber and dealer stocks are low, but mills have plenty of material on hand.

Worcester, Mass.—Production continues on summer schedules, with the gradual decline which started several weeks ago still in evidence. The severe competition which developed from an unstabilized price foundation continues to harass the market.

New York—Wire nails appear generally established at $1.80, Pittsburgh, to jobbers, and $1.90 to the general trade, although there is little demand to test the market. Sellers are quoting 2.20c, Pittsburgh, on plain bright wire for prompt and third quarter delivery. Cut nails are firm here at $2.50, Pittsburgh, for car lots. For less than car lots, involving five kegs and over, the market is $2.75 and for less than five kegs, $2.90. No change in these prices is expected.

Shelter Island sound bridges at New York will require 1000 tons of cable and accessories.

Philadelphia—Demand for nails is light at $1.80 to $1.90, Pittsburgh. Wire is quoted at 2.20c, Pittsburgh.

Pittsburgh—Activity in wire products is unchanged. Incoming business continues light and buyers show little interest in future needs. Third quarter contracting generally is on the basis of old prices with the market $1.80 to $1.90 to jobbers for wire nails and 2.20c for plain wire. Incoming business is little changed but holds near the quietest rate of the year. Shipments are at a correspondingly low level with little change noted over the past several weeks.

Cleveland—Several contracts for third-quarter coverage in wire products have been closed the past week at prices prevailing the current quarter. On the other hand,a disposition on the part of other customers has been toward slowness in anticipating needs. Manufacturers' wire on mill books is being released at 2.20c, Pittsburgh, and standard wire nails are $1.90 a keg. Formal price announcement involving change in these figures is not anticipated by the trade. Mill operations have undergone a slight curtailment, after several weeks of steadiness.

A large tonnage of fencing and post uprights will be required for a fencing project surrounding the Goodyear Zeppelin dock, Akron, O.

Bolts and Nuts Reflect 73, 10 Off Price in East

Bolts, Nuts, Rivets Prices, Page 49

Pittsburgh—Third quarter contracting for bolts, nuts and rivets is slow and specifications are declining slowly. Incoming business so far this month is lighter than in May and little improvement is in prospect. Contracting is on the basis of 73 off for bolts and nuts and 2.75c, Pittsburgh, for large rivets.

New York—Several large eastern bolt and nut manufacturers are adopting 73 and one 10 off list with indications that others will follow. Rivets are weak but unchanged in price. Operations are at about 35 per cent of capacity and demand is dull.

Pennsylvania railroad is expected to award 40,000 copper and bronze bolts and nuts.

Chicago — While shipments of bolts, nuts and rivets are off about 50 per cent from June, 1930, this represents less carryover than last year. Orders and shipments in June this year have been about equal. Many of the usual buyers have contracted for third quarter at 73 off list for bolts and nuts. Implement and tractor production is not expected to be of consequence before late autumn.

Postal Box Bids In

New York,—Van Dorn Iron Works, Cleveland, is low on 3000 large steel collection boxes for the post office department with a bid of $10.21 each and on 3500 No. 1 storage boxes at $7.48 each. Parish Pressed Steel Co., Reading, Pa., is low on 1250 No. 2 storage boxes at $10.25 each. Formal award of the contract, which covers postal needs for this material for the fiscal year starting July 1, is expected soon.

Raw Material Prices

Pig Iron

Per Gross Ton

FOUNDRY, No. 2

Chicago furnace	$17.50
Pittsburgh, dist. fur.	17.50
Pittsburgh, delivered	18.13 to 18.63
Valley furnace	17.00
Cleveland fur., local del.	17.00
Philadelphia, delivered	17.26
Virginia, furnace	17.75
Granite City, Ill., fur.	17.50
Buffalo, fur., local del.	17.00
Buffalo, del. Boston	21.41 to 21.91
Buff., all-rail, Brooklyn	19.91 to 20.91
Buff., all-rail Newark	18.28 to 18.78
Ala., Bir. fur., local del.	12.00 to 13.00
Alabama, del. Chicago	17.01
Alabama, del. St. Louis	15.42
Alabama, del. Cincinnati	14.69 to 15.19
Ala., Phila., dock del.	16.25
Ala., Balt., dock del.	16.00
Alabama, New York dock	16.50
Ala., Boston dock del.	16.75
Tenn., Bir. base, local del.	13.00
Tennessee, del. Cinn.	14.69 to 15.19
Montreal, delivered	23.50
Toronto, delivered	22.10

FOUNDRY, NO. 2X

Buffalo, fur., local del.	17.50
Buff., all-rail, Brooklyn	20.91 to 21.41
Buffalo, all-rail Newark	18.78 to 19.28
Buffalo, del. Boston	21.91 to 22.41
Virginia furnace	18.25
Eastern, del. Phila.	17.76

FOUNDRY, NO. 1X

Buffalo fur., local del.	18.50
Eastern, del. Phila.	18.26

MALLEABLE

Valley furnace	17.00
Cleveland fur., local del.	17.00
Pittsburgh dist. fur.	17.50
Pittsburgh, delivered	18.13 to 18.63
Chicago, furnace	17.50
Buffalo fur., local del.	17.50
Eastern Penna., delivered	18.26 to 20.91
Granite City, Ill., fur.	17.50
Montreal, delivered	24.00
Toronto, delivered	22.60

BASIC

Pittsburgh, district fur.	16.00 to 16.50
Pittsburgh, delivered	16.63 to 17.63
Eastern Penn., del.	17.00
Buffalo fur., local del.	16.50 to 17.00
Montreal, delivered	20.50
Valley, furnace	17.00

BESSEMER

Valley furnace	17.00
Pittsburgh, delivered	18.13 to 18.63
Pittsburgh, furnace	17.50

LOW PHOS.

Valley fur., standard	27.00
Philadelphia, standard	23.76 to 26.79
Copper-bear., E. Pa. fur.	22.50 to 23.00

GRAY FORGE

Valley furnace	16.50
Pittsburgh district fur.	17.00
Pittsburgh, delivered	17.63 to 18.13

CHARCOAL

Lake Superior, del. Chi.	27.04

SILVERY

Jackson County, O., fur., in per cents 6—$21; 7—$21.50; 8—$22; 9—$22.50; 10—$23; 11—$24; 12—$25; 13—$27.

BESSEMER FERROSILICON

Jackson County, O., fur., in per cents 10—$25; 11—$26; 12—$27; 13—$29; 14—$31; 15—$26; 16—$35.

Coke

Prices Per Net Tons

Beehive Ovens

Connellsville furnace	$2.40 to 2.50
Connellsville foundry	3.25 to 4.75
New River foundry	6.00
Wise county foundry	4.25 to 5.00
Wise county furnace	3.50 to 4.25

By-Product Foundry

Newark, N. J., del.	8.70 to 9.10
Chicago, ovens	7.50
New England, del.	10.50
St. Louis, del.	8.50
Birmingham, ovens	5.00
Indianapolis, del.	8.25
Ashland, Ky., ovens, Connell., basis	5.50
Portsmouth, O., ovens, Connell., basis	5.50
Buffalo, ovens	8.00 to 8.50
Detroit, ovens	8.00
Philadelphia, del.	8.75

Iron Ore

LAKE SUPERIOR ORE

Gross ton, 51½%, Lower Lake Ports	
Old range bessemer	$4.80
Mesabi bessemer	4.65
Old range nonbessemer	4.65
Mesabi nonbessemer	4.50
High phosphorus	4.40

EASTERN LOCAL ORES

Cents per unit delivered at Eastern Pennsylvania and New Jersey furnaces

Foundry and basic, 56-63%, contract	10.00
Copper-free low phos. 58-65%	nom.

FOREIGN ORE

Cents per units, alongside docks Atlantic ports

Foreign manganiferous ore, 45-55% iron, 6-10% manganese	10.00
North African low phosphorus	8.50
Swedish basic, 65%	9.00
Swedish low phos.	10.00
Spanish, North African basic, 50 to 60%	8.50 to 9.00
Newfoundland fdy., 55%	8.50
Tungsten, spot and future short ton unit, duty paid	$11.25 to $11.50
Chrome ore, 48% net ton c.i.f.	$21.50 to 22.00

Manganese Ore

Prices, not including duty, are cents per unit; cargo lots.

Caucasian, 52-55% (nom.)	26 to 28 cents
South African, 52%	26 to 28 cents
South African, 49-51%	25 to 26 cents
South African, 44-47%	24 cents
Indian, 48-50%	nom.
Brazilian, 46-48% (nom.)	22 cents

Refractories

FIRE CLAY BRICK

Per 1000 f.o.b. Works

First Quality

Pennsylvania, Ohio, Illinois, Kentucky, Missouri, Maryland	$40.00
Georgia, Alabama	40.00

Second Quality

Pennsylvania, Ohio, Illinois, Kentucky, Missouri, Maryland	35.00
Georgia, Alabama	30.00 to 35.00

SILICA BRICK

Pennsylvania	40.00
Joliet, Ill., East Chicago, Ind.	49.00
Birmingham, Ala.	50.00

MAGNESITE BRICK

Per Net Ton

9 x 4½ x 2½	$65.00

MAGNESITE

Dead burned grain, net ton, Chester, Pa., or Baltimore bases	40.00
Domes, Chewelah, Wash., base	22.00

CHROME BRICK

Net ton, Chester, Pa., and Baltimore base, 9 x 4½ x 2½	45.00

Semifinished Steel

PRICES PER GROSS TON

BILLETS AND BLOOMS

4 x 4-inch base

Pittsburgh, open-hearth	$29.00 to 30.00
Pittsburgh, bessemer	29.00 to 30.00
Youngstown	29.00
Cleveland	29.00
Philadelphia	34.30
Chicago	30.00
Forging, Chicago	35.00 to 36.00
Forging, Pittsburgh	35.00 to 36.00
Forging, Philadelphia	40.30

SHEET BARS

Pittsburgh	29.00
Youngstown	29.00
Cleveland	29.00
Chicago	30.00

SLABS

Pittsburgh	29.00 to 30.00
Youngstown	29.00
Cleveland	29.00

WIRE RODS

Pittsburgh, Cleveland	35.00
Chicago	36.00

SKELP

All grades, Pittsburgh	1.60c

Ferroalloys

(In dollars, except Ferrochrome)

*Ferromanganese, 78-82%, tidewater, duty paid	$85.00
*Ferromanganese, del. Pittsburgh	89.70
Spiegeleisen, 19-20%, domestic fur. spot†	30.00
Ferrosilicon, 50 per cent, freight all., c. l.	83.50
Do, less carload	88.50
Do, 75 per cent	130.00 to 150.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb., con., del.	11.00
Do, for spot delivery	11.50
Ferrotungsten, stand., lb. cont.	1.00 to 1.10
Ferrovanadium, 30-40 per cent, per lb., contained, on analysis	3.15 to 3.65
Ferro-carbon-titanium carload producers' plants, net ton	150.00
Do, one-ton to c. l.	170.00
Ferrophosphorus, per ton, carload 17-19 per cent, Rockdale, Tenn., basis (18 per cent)	91.00
Ferrophosphorus, electrolytic per ton carload, 23-25% f.o.b. Anniston, Ala., 24%	122.50

†Carloads. Differentials apply to large quantities.

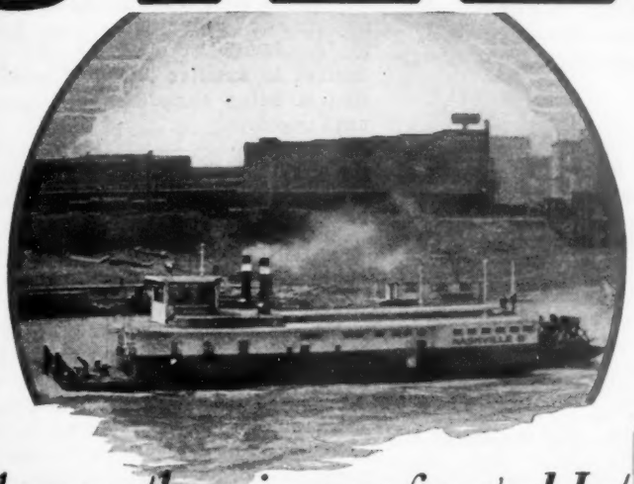
*To users of carloads to 500 tons annually. Differentials apply to users of larger quantities.

Fluorspar

85 and 5 per cent grade

Washed gravel Kentucky and Illinois mines, per net ton	$13.50 to 14.00
Washed gravel, import duty paid east, tide, gross ton	18.50 to 19.00

STEEL FOR BOATS BRIDGES OR BUILDINGS



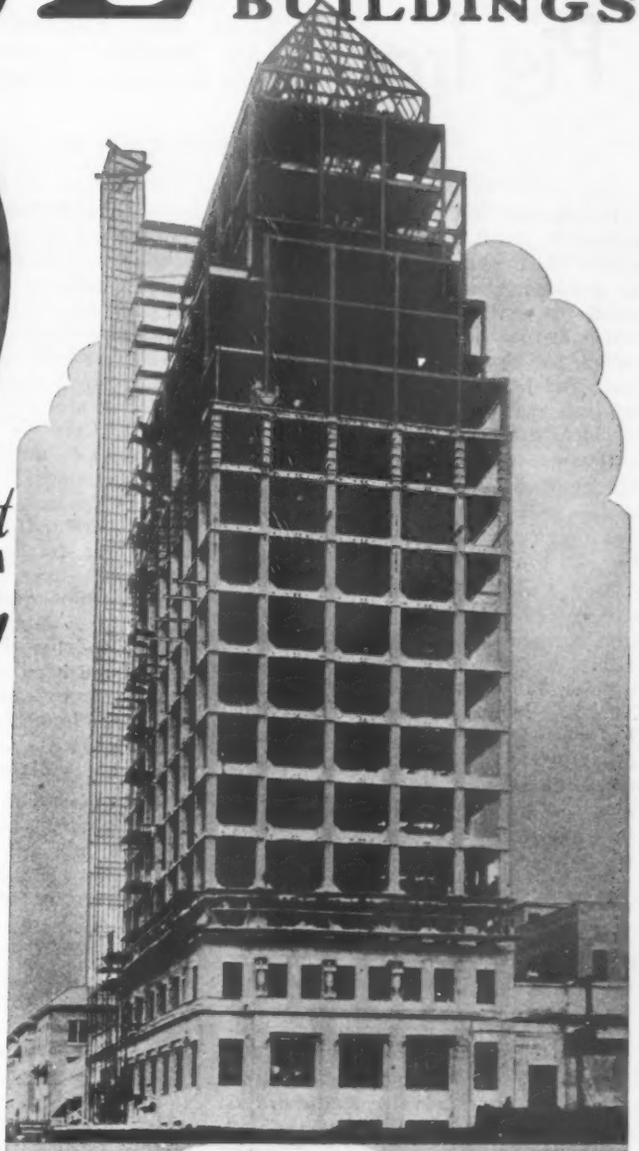


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figure on your requirements. Quality products backed by careful inspection—prompt shipments, with intelligent cooperation through understanding of the customer's needs—these are some of the reasons which make Tennessee a desirable source of supply.

Products: Structural Shapes, Plates, Bars and Small Shapes, Sheets (Blue Annealed, Black and Galvanized), Rails and Accessories, Forgings Castings, Semi-Finished Products, Pig Iron.

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Subsidiary of United States Steel Corporation

Pig Iron

Sales and Shipments Below Last Month's Levels—Freight Rate Prospects Steady Prices

PIG IRON PRICES, PAGE 60

Pittsburgh—Sales of pig iron are limited to small lots and the number shows little change. No inquiries are pending, consumers not being disposed to anticipate future needs. Prices are fairly steady at $17, base, valley, for No. 2 foundry, malleable, basic and bessemer. Occasional concessions are noted on purchases here for local delivery.

Boston—Sales are at a low ebb, aggregating 500 tons in this district in the past week. The Hyde Windless Co., Bath, Me., is in the market for 250 tons of No. 2X.

New York—Pig iron sales, aggregating 3000 tons, are slightly larger than a week ago. The Worthington Pump & Machinery Corp. is inquiring for 300 tons of No. 2 plain and No. 2X for Harrison, N. J., and Holyoke, Mass. Thatcher Furnace Co., Garwood, N. J., is in the market for 3000 tons of No. 2 plain. Shipments of pig iron and billets on the New York state barge canal during the week ended June 13 aggregated 2401 tons, bringing the season's total to a figure 12,962 tons less than the corresponding period of 1930.

Philadelphia—Demand for pig iron is listless, and prices are unchanged, eastern Pennsylvania foundry iron holding at $17.26, delivered, Philadelphia. The Southern railroad is inquiring for 100 to 200 tons of foundry iron for Baltimore, and the Baltimore & Ohio for 75 to 150 tons comprising three grades.

Buffalo—Another merchant stack has been blown in, to produce silvery and bessemer ferrosilicon. Four furnaces now are active in this district. Inquiries and sales are small, and shipments disappointing.

Youngstown, O.—Three blast furnaces in the Mahoning and Shenango valleys have gone out since June 1, on which date 12 were active, out of a total of 30 merchant and steel works stacks in the valley. The Shenango Furnace Co. stack at Sharpsville, Pa., and the stacks at New Castle, Pa., of the Carnegie Steel Co. have been blown out. One unit of the Youngstown Sheet & Tube Co. at Campbell, O., has been banked. Small sales of No. 2 foundry, malleable, basic and bessemer continue to be made at $17, valley.

Cleveland—Shipments are proceeding at a slower rate than in May, and new business is at a considerably lower level than last month. Furnace interests with headquarters in Cleveland did not sell more than 5000 in the past week. Some inquiries for third quarter, pending several weeks, have not been closed; the great majority of consumers will continue to order small lots as required. With the possibility of a railroad freight increase, which would lift production costs in the Lake Erie territory 50 to 75 cents a ton, producers do not see any chance of a further reduction in prices. Small lots of foundry and malleable bring $17, base, Cleveland, for local delivery, while lake furnaces generally obtain $16 to $17, base, in competitive territory in Ohio and Indiana, and $17 to $17.50 in Michigan. The market for silvery and bessemer ferrosilicon iron is untested here, and sellers say Jackson county quotations have not changed, though individual sales have been reported at $1 and $2 under the schedules in other districts.

Cincinnati—Carload bookings reflect a tapering in demand. An order for 500 tons of northern iron was placed by a central Ohio melter. Little buying of Southern iron is reported.

Chicago—Sentiment in the pig iron market has improved as prospects appear for an increase in the melt late in the summer. Negotiations now are on for several third quarter contracts. The implement outlook still is discouraging as production on an important scale is not likely until early winter. June deliveries will show a marked decline from May. The price of $17.50, Chicago furnace, holds for the base grades, except for occasional small steelworks offerings. Two automotive foundries in this district are down temporarily.

St. Louis—Current orders are limited to single carloads up to 150 tons, all for immediate delivery. Shipments on contracts are holding up well, the majority of consumers taking what is due them, though a considerable amount of iron is going on stockpiles. The melt in this district in the first half of June was about 8 per cent less than the May average.

Birmingham, Ala.—Pig iron consumption in this district continues to decline. No further change in blast furnace operations is noted. Pipe producers look forward to new specifications.

Toronto, Ont.—Although the daily rate of the melt is beginning to taper, no drastic reductions have been made. Merchant pig iron sales are limited to smaller lots, and production is being curtailed. Prices are unchanged.

Ferroalloy Demand Continues Restricted

Ferroalloy Prices, Page 60

New York—Reflecting dullness in the steel industry, shipments of ferromanganese and spiegeleisen are moving slowly. Prices are nominally unchanged with ferromanganese $85, duty paid, in car lots, and domestic spiegeleisen, 19 to 21 per cent, $30, furnace, in car lots. High silicon spiegeleisen is moving in small quantities, largely for experimental purposes, at $35, furnace. Foreign spiegeleisen, 26 to 28 per cent, is nominal.

Pittsburgh—Ferroalloy shipments continue to decline slowly and are near the slowest rate of the year. Recent sales of ferrotungsten have been made at $1.05, although activity in this grade is light. Ferromanganese continues $89.79 delivered, with spiegeleisen $30, furnace, both prices applying on small lots.

Iron Ore Imports Larger; North African Easier

Iron Ore Prices, Page 60

New York—North African low phosphorus ore is easier at 8½ cents per unit, alongside docks at Atlantic ports, with current demand slow. Recent substantial importations of Russian iron ore at Baltimore have attracted attention to arrivals at that port since the present movement began last September. Practically all this ore, it is reliably understood, is for the Bethlehem Steel Co. Arrivals in May totaled 32,100 tons, in five cargoes. This compares with 24,000 tons in April; 20,000 tons in March and 17,000 tons in February.

Beacon Towers Are Let

Dallas, Tex.—Airports Engineering & Construction Co. has the contract for erection of 33 galvanized steel airway beacon towers on the Phoenix-El Paso route, steel being fabricated by the International Derrick & Construction Co. There are 29 towers 51 feet high, one 87 feet, one 75 feet and two 20 feet, with a total weight of 75,500 pounds.

Scrap

Strong Pressure for Lower Prices but Sellers Resist—Some Scarcity Becoming Apparent

Chicago—Steel scrap yards expect 45 to 60 days of extremely light shipments and sporadic buying. A leading open-hearth scrap melter again has ordered several shippers to reduce delivery schedules. Less of a buyers' market exists, as dealers have built up a wall of resistance to further price recessions. It is believed prices are not likely to go lower, but conditions are not favorable for advances. Occasional scrap offerings bring higher prices. Hydraulic compressed sheets, for shipment over the next three months, sold on an industrial list at $8 gross, delivered, as against recent consumer sales ranging at $7 to $7.50. Opinions differ on the effects of the suggested freight rate advance, but many views are that buyers may seek to place orders

Iron and Steel Scrap Prices

Corrected to Tuesday noon. Gross tons delivered to consumers, except where otherwise stated

HEAVY MELTING STEEL

Birmingham	$8.00 to $9.00
Boston, dealers	4.00 to 4.10
Buffalo, No. 1	9.00 to 9.50
Buffalo, No. 2	**8.00 to 8.50**
Chicago	**8.50 to 9.00**
Cinn., deal.	7.50 to 8.00
Cleve., No. 1	8.50 to 9.00
Cleve., No. 2	8.00 to 8.25
Det., No. 1 deal.	7.25 to 7.75
Det., No. 2 deal.	**6.00 to 6.50**
E. Pa. del. mill	8.00 to 9.00
N. Y. deal. R. R.	4.50 to 6.50
N. Y. deal. No. 2	3.50 to 4.00
N. Y. deal. yd.	4.00 to 4.50
Pitts., No. 1	9.50 to 10.00
St. L. No. 1 sel.	8.25 to 8.75
Federal, Ill.	**8.00 to 8.50**
Granite City, Ill.	7.00 to 7.50
Valleys, No. 1	**10.00 to 10.50**

COMPRESSED SHEETS

Buffalo, dealers	7.50 to 8.00
Chicago	**7.00 to 7.50**
Cleveland	7.50 to 8.00
Detroit, dealers	6.75 to 7.25
E. Pa. new mat.	8.00 to 9.00
Pittsburgh	9.50 to 10.00
Valleys	**9.50 to 10.00**

BUNDLED SHEETS

Buffalo	5.50 to 6.00
Cinci., deal.	6.75 to 7.25
Cleveland	6.50 to 7.00
Eastern Pa.	**7.50 to 8.00**
Pittsburgh	8.00 to 8.50
St. Louis	**5.50 to 6.00**

SHEET CLIPPINGS LOOSE

Chicago	**4.00 to 4.50**
Cincinnati	4.00 to 4.50
Detroit, dealers	4.00 to 4.50
St. Louis	**5.50 to 6.00**

STEEL RAILS SHORT

Birmingham	11.00 to 11.25
Boston, dealers	3.00 to 4.10
Buffalo	12.00 to 12.50
Chicago (3 ft.)	10.00 to 10.50
Chicago (2 ft.)	10.75 to 11.25
Cinci., deal.	**13.00 to 13.50**
Detroit, deal.	11.00 to 11.50
Pitts. (open-hearth, 3 ft. and less)	12.50 to 13.00
St. Louis	**12.00 to 12.50**

STOVE PLATE

Birmingham	7.00 to 7.50
Boston, con.	**5.00 to 5.50**
Buffalo	7.50 to 8.00
Chicago, net	**7.00 to 7.50**
Cinci., deal. net	**4.50 to 5.00**
Det., net deal.	**4.00 to 4.50**
Eastern Pa.	**7.50 to 8.00**
N. Y., deal. mill	**4.00 to 4.50**
St. Louis	7.00 to 7.50

COUPLERS, SPRINGS

Buffalo	12.00 to 12.50
Chicago	10.00 to 10.50
Eastern Pa.	**13.00**
Pittsburgh	12.50 to 13.00
St. Louis	**8.75 to 9.25**

ANGLE BARS—STEEL

Chicago	9.75 to 10.25
St. Louis	8.25 to 8.75

LOW PHOSPHORUS

Buffalo, billets and bloom crops	14.00 to 14.50
Cleveland bil. and bloom crops	**12.00 to 12.50**
Eastern Pa.	13.50 to 14.00
Pittsburgh billet bloom crops	**14.50 to 15.00**
Pitts. sheet bar crops	**13.50 to 14.00**

FROGS, SWITCHES

Chicago	8.50 to 9.00
St. Louis	**9.00 to 9.50**

SHOVELING STEEL

Chicago	8.50 to 9.00
Cleveland	6.25 to 6.75
St. Louis	8.00 to 8.50

RAILROAD WROUGHT

Birmingham	**8.00 to 8.50**
Boston, dealers	**8.00 to 8.50**
Buffalo, No. 1	7.50 to 8.00
Buffalo, No. 2	9.00 to 9.50
Chicago, No. 1	**8.25 to 8.70**
Chicago, No. 2	**8.50 to 9.00**
Cinci., No. 2	7.50 to 8.00
Eastern Pa.	**10.00**
N. Y., No. 1, deal.	**9.00 to 9.50**
Pitts., No. 2	9.50 to 10.00
St. Louis, No. 1	5.25 to 5.75
St. Louis, No. 2	**8.00 to 8.50**

SPECIFICATION PIPE

Boston	**5.00 to 5.25**
Eastern Pa.	10.00 to 10.50
N. Y., deal	**6.00 to 6.50**

BUSHELING

Buffalo No. 1	7.50 to 8.00
Chicago, No. 1	**7.00 to 7.50**
Cinn., No. 1 dl.	6.00 to 6.50
Cinn., No. 2	3.50 to 4.00
Cleve., No. 2	**6.00 to 6.50**
Det., No. 1 new deal.	**5.50 to 6.00**
St. L., No. 1	6.00 to 6.50
Val. new No. 1	**9.00 to 9.50**

MACHINE TURNINGS

Birmingham	4.50 to 5.00
Boston, dealers	0.60 to 1.00
Buffalo	4.75 to 5.00
Chicago	3.50 to 4.00
Cinn., deal.	3.75 to 4.25
Cleveland	5.25 to 5.50
Detroit	**3.00 to 3.50**
Eastern Pa.	**5.00 to 6.00**
N. Y., deal.	2.00
Pittsburgh	**6.50 to 7.00**
St. Louis	**3.50 to 4.00**
Valleys	**6.00 to 6.50**

BORINGS AND TURNINGS
For Blast Furnace Use

Boston	0.50 to 0.80
Buffalo	5.75 to 6.25
Cinn., deal.	3.75 to 4.25
Cleveland	6.25 to 6.75
Detroit, deal.	3.50 to 4.00
Eastern Pa.	5.50
N. Y., deal.	2.00
Pittsburgh	6.75 to 7.25

CAST IRON BORINGS

Birming., chem.	**12.50 to 13.00**
Birming., plain	4.50 to 5.00
Boston, chem.	7.00 to 7.25
Boston, deal.	0.60 to 1.00
Buffalo	5.75 to 6.25
Chicago	**3.50 to 4.00**
Cinn., deal.	3.75 to 4.25
Cleveland	6.25 to 6.75
Detroit, deal.	**3.50 to 4.00**
Eastern Pa.	**5.00 to 6.00**
E. Pa., chem.	11.50 to 12.50
N. Y., deal.	2.00 to 2.50
Pittsburgh	**6.75 to 7.25**
St. Louis	**5.00 to 5.50**

PIPE AND FLUES

Cinn., deal.	6.00 to 6.50

RAILROAD GRATE BARS

Buffalo	6.50 to 7.00
Chicago, net	6.00 to 6.50
Cincinnati	**5.50 to 6.00**
Eastern Pa.	7.50 to 8.00
N. Y., deal.	5.00 to 5.50
St. Louis	6.00 to 6.50

FORGE FLASHINGS

Boston, deal.	5.00 to 5.25
Buffalo	7.50 to 8.00
Cleve. ov. 10 in.	6.50 to 7.00
Detroit	5.75 to 6.25

FORGE SCRAP

Boston, del.	5.00 to 5.25
Chicago	11.50 to 12.00
Eastern Pa.	9.00 to 10.00

ARCH BARS, TRANSOMS

Chicago, net	10.50 to 11.00
St. Louis	8.25 to 8.75

AXLE TURNINGS

Boston, deal.	6.75 to 7.00
Buffalo	8.00 to 8.50
Chi., steelworks	**7.50 to 8.00**
Cleveland	6.75 to 7.00
Eastern Pa.	8.00 to 9.00
Pittsburgh	8.75 to 9.25
St. Louis	7.00 to 7.50

STEEL CAR AXLES

Birmingham	12.50 to 13.00
Boston, ship. pt.	11.00 to 12.00
Buffalo	15.50 to 16.00
Chicago	12.90 to 13.45
Eastern Pa.	18.50 to 19.50
St. Louis	12.50 to 13.00

SHAFTING

Bos., ship. pt.	10.00 to 10.50
Chicago	**9.55 to 10.10**
N Y., deal.	12.00 to 13.00
St. Louis	9.50 to 10.00
E. Penna.	13.00

CAR WHEELS

Birming., iron	8.00 to 9.00
Boston, iron	14.00 to 14.50
Buffalo, iron	10.75 to 11.25
Buffalo, steel	11.75 to 12.25
Chicago, iron	10.50 to 11.00
Chi. rolled steel	11.00 to 11.50
Cincinnati, iron	10.50 to 11.00
E. Pa. steel	12.00
E. Pa. iron	**12.50 to 13.00**
Pitts. iron	10.50 to 11.00
Pitts., steel	12.50 to 13.00
St. Louis, iron	7.75 to 8.25
St. Louis, steel	**10.00 to 10.50**

NO. 1 CAST SCRAP

Birmingham	10.00 to 10.25
Buffalo (mach.)	9.50 to 10.00
Boston, textile	10.00 to 10.50
Chicago, mach.	9.80 to 10.35
Chi., railroad	8.70 to 9.25
Chicago, agri.	8.40 to 8.95
Cinn., mach. cup., gross	**12.25 to 12.75**
Cleve. cupola	10.00 to 10.50
Det., net deal.	8.00 to 8.50
E. Pa. cupola	**12.50 to 13.00**
N. Y. cup. deal.	7.00 to 7.50
N. Y., del. local foundries	**12.00**
Pitts., cupola	10.50 to 11.00
San Fran., del.	13.50 to 14.00
Seattle	7.50 to 8.00
St. L. No. 1 ma.	9.00 to 9.50
St. L. No. 1	8.25 to 8.75

HEAVY CAST

Boston	**10.50 to 11.00**
Bos. mach. cast	**11.50 to 12.50**
Buffalo, break	**6.50 to 7.00**
Cleve., break	**6.50 to 7.00**
Detroit, auto, net deal.	**10.50 to 11.00**
Det., break., dl.	5.50 to 6.00
Eastern Pa.	10.00 to 11.00
N. Y. No. 1 dl.	**7.00 to 7.50**
N. Y. break. dl.	6.00 to 6.50
Pittsburgh	8.00 to 9.00

MALLEABLE

Boston R. R.	**13.00 to 13.50**
Buffalo	10.00 to 10.50
Chicago, agri.	**9.00 to 9.50**
Chicago, R. R.	**9.50 to 10.00**
Cinn., R. R. dl.	**11.00 to 11.50**
Cinn., agri., dl.	10.00 to 10.50
Cleveland, rail	10.00 to 10.50
Det. auto deal.	**10.50 to 11.00**
St. Louis, rail	**8.00 to 8.50**

RAILS FOR ROLLING
5 feet and over

Birmingham	10.50 to 11.00
Boston	**7.50 to 8.00**
Buffalo	10.00 to 10.50
Chicago	10.50 to 11.00
Eastern Pa.	11.50 to 12.00
New York	7.00 to 7.50
St. Louis	**10.25 to 10.75**

LOCOMOTIVE TIRES

Chicago, cut	11.50 to 12.00
St. L., No. 1	**10.50 to 11.00**

LOW PHOS. PUNCHINGS

Chicago	10.75 to 11.25
Buffalo	13.00 to 13.50
Eastern Pa.	13.00 to 14.00
Pittsburgh	13.50 to 14.00

IF IT'S TO BE WELDED

Use Ingot Iron Plates and Welding Wire

Where sheet or plate construction must be joined speedily, smoothly, and durably, you'll find the combination of rust resisting Ingot Iron and Page-Armco welding wire a good one. Complete fusion is assured, whether the process employed is electric or acetylene. This dense, uniform iron flows evenly and unites in a sound union, as strong and lasting as the surrounding metal. And the weld is certain to be smooth and ductile. Then, too, you have the satisfaction of knowing that the equipment or construction is all Ingot Iron — the iron with the longest record of actual service of any low-cost, rust-resisting sheets or plates. This is important where welded construction must endure to be economical. Whatever your requirements for Ingot Iron welding wire, there is a suitable grade produced by the Page Steel and Wire Company, Pittsburgh. Write to them. As for Ingot Iron plates and sheets, there is a finish, gage and size to meet your specific needs of fabrication or construction. Just communicate with the nearest office for the facts.

THE AMERICAN ROLLING MILL COMPANY

Executive Offices: MIDDLETOWN, OHIO
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DISTRICT OFFICES: *Chicago · Cincinnati · Cleveland · Detroit*
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ARMCO
IRON AND STEEL
SHEETS EXCEPTIONAL QUALITY **PLATES**

ahead at existing prices, especially under contracts involving delivered price orders at other points. Offers of rerolling rails as low as $10.75, Chicago switching district, have been turned down.

Boston—The three or four active items of scrap dropped to new low levels in the past week. The American Steel & Wire Co. at Worcester has reduced heavy melting steel and bundled skeleton 50 cents a ton to $6.50 a ton delivered for steel and $5.50 for skeleton. This leaves dealers to get $4.10 on cars shipping point for steel and $3.10 for skeleton.

New York—Iron and steel scrap prices continue weak with No. 1 heavy melting steel reported sold at $8 for delivery at Claymont, Del., and Bethlehem, Pa. Shipments have been resumed moderately to the Claymont mill. The Coatesville, Pa., interest is reported out of the market with most mills taking only limited tonnages. About 1000 tons of sections from a wrecking job on lower Manhattan is reported to have sold to Bethlehem Steel Co. at $3.

Philadelphia—Heavy melting steel now is holding at $8 to $9, delivered, consumers, a reduction of $1 a ton. Bethlehem Steel Co. has purchased 1000 tons at $8, delivered, Bethlehem, and the leading Claymont, Del., consumer, which recently resumed taking shipments on back orders is understood to have closed on some scattered lots at the same figure. Bethlehem Steel Co. has dropped its offering price at Sparrows Point, Md., 50 cents a ton to $8, delivered. Compressed sheets are down $1 to a range of $8 to $9. Sentiment is distinctly better but trading continues light.

Buffalo—The leading consumer has reduced his offer for heavy melting steel to $9 for No. 1 and $7.50 for No. 2. In each case these are reductions from previous low prices. The trade, while refusing so far to make tonnage sales at these prices, admits that the market has been weakened by this cut and prices are nominally fractionally lower.

Pittsburgh—Prices of steel scrap are lower on a sale of 10,000 tons of heavy melting steel and compressed sheets at 50 cents below the recent market, reducing both grades to $9.50 to $10, a new low level for the year. Activity in other grades is slight with some prices lower but largely nominal.

Cleveland—An independent steelworks has held up shipments of blast furnace material, further restricting local movement of scrap. Some steel scrap is moving to the Steel corporation subsidiary. Only a few cars are going to out-of-town consumers. Prices are holding nominally unchanged following the declines of the past week. Little further decline in scrap prices is anticipated by dealers here.

Detroit—For the first time in a number of weeks, iron and steel scrap prices are stationary. Dealers are encouraged to believe that this indicates that the bottom is at hand or near. The local steel works, with its yards full, is not in the market and there is little demand for scrap for movement to the Youngstown or Pittsburgh districts. Offerings from steel manufacturers show a steady decline, with this trend expected to hold through July at least. Ford Motor Co. is selling little scrap. Fisher Body Co. has offered 2500 tons of cast iron dies.

Cincinnati—Restrictions by normally heavy consumers of iron and steel scrap have seriously cut shipments and weakened the market. Heavy melting steel, sheet clippings and borings are notable among items quoted lower. Orders are light and provide no test of prices.

St. Louis—Feature of the iron and steel scrap situation is the nearest approach to price stability noted in a considerable while. After many weeks of continuous declines, prices since June 1 have fluctuated in a narrow range, and on some items begin to show resistance to pressure. There is growing talk, chiefly among dealers, of a possible scrap scarcity later in the year.

Toronto, Ont.—New business continues dull in iron and steel scrap. Consumers are adhering to hand-to-mouth buying and no future delivery contracts were placed during the week. Mills are picking up supplies from the railways, but are not buying much from dealers, with the result that shipments of heavy melting steel and turnings to the Hamilton district are small.

Canadian Scrap

Dealers' Buying Prices

MONTREAL

Per Gross Ton

Iron axle	$11.00
Steel axles	10.00
Car wheels	8.00
Stove plate	8.00
Wrought pipe	2.00
Turnings	2.00
Heavy melting steel	6.00

TORONTO

Steel axles	7.00
Iron axles	7.00
Heavy melting steel	7.00
Turnings	2.00
No. 1 mach. cast (net)	9.00
Malleable (net)	7.00

Coke

Connellsville Output at Lowest Point of Year—Furnace and Foundry Demands Quiet

COKE PRICES, PAGE 60

Pittsburgh—Demand for beehive coke continues at the recent quiet rate, the coal strikes having little influence on the market. Sales of both furnace and foundry grades are steady, but light, with prices holding at $2.40 to $2.50 for the furnace grade and $3.25, minimum for standard foundry fuel. The absence of any scarcity in supplies of coke or coal precludes forward buying. Production in the Connellsville district is at the lowest level of the year.

Boston—Foundries are deferring coke shipments, having stocks far in excess of current needs. Contracts for the last half may be reduced considerably. Prices are unchanged.

New York—Coke sellers hope that the slight acceleration in foundry operations will be reflected soon in improved demand. Beehive furnace coke continues $2 to $2.25, Connellsville, Pa., Standard beehive foundry grades are $3.25, Connellsville, and premium brands, $4.50, ovens, and higher. By-product coke is $8.70 to $9.10, Newark, N. J.; $10.50, New England; and $8.75, Philadelphia.

Cincinnati—Shipments of by-product foundry coke continue at a slow rate, with new business unimpressive. Quotations are unchanged.

Chicago—Contracting for and shipments of by-product foundry coke are gaining due to the possibilities of a freight rate increase and the coal strike situation. Prices are steady.

St. Louis—Coke shipments in the first half of June were the smallest of any similar period since last summer. Extremely hot weather has tended to reduce requirements. No interest is noted in forward business.

Birmingham, Ala.—Demand for coke continues limited to small lots. Prices are easy.

Pacific Coast

Close Bidding on Golden Gate Bridge Shows Builders' Interest —Variation Less Than 2 Per Cent—Only Public Projects Keep Semblance of Activity in Northwest States

San Francisco—(*By Air Mail*)—Interest this week was centered around the opening of bids on the 110,000-ton Golden Gate bridge over San Francisco bay. A difference of only $182,000 on a $10,494,000 project separated the high bidder, the Columbia Steel Co., subsidiary of the United States Steel Corp., from the low bidder, McClintic-Marshall Corp., subsidiary of Bethlehem Steel Corp., on the main span and towers. This portion of the structure involved 72,000 tons. The American Cable Co. was low bidder at $6,255,767 for furnishing in place 28,000 tons of steel cable, while the Columbia Steel Co. was low bidder on the approach spans at $996,000.

Bids were taken on ten units. On the three units comprising the various forms of steel work, the main structure, the cables and the approach spans, the combined bid of the Columbia Steel Co. was low by $47,167. It will be some weeks before the city of San Francisco reaches a decision.

Coast Pig Iron Prices

Utah basic	$22.00 to 24.00
Utah foundry	22.00 to 24.00
*German	24.25
*Indian	22.00 to 24.00

*C.i.f. duty paid.

Bars, Plates and Shapes

Demand for concrete bars is holding up well and awards this week aggregated 1440 tons. Larger lettings included 240 tons for highway work in Colusa county, Calif., placed with an unnamed interest, 250 tons for a church in San Francisco, placed with Gunn, Carle & Co., and 420 tons for the Sloat boulevard viaduct, San Francisco, booked by W. S. Wetenhall Co. Bids have been opened on 2658 tons for the Golden Gate bridge and bids are being taken on 150 tons for a theater in Alameda, Calif. No change has occurred recently in out-of-stock prices in the Los Angeles and San Francisco districts. Quotations in the former city hold at 2.50c, base, on carload lots, while prices in the latter district are firm at 2.60c.

Activity in the plate market is confined to small projects. No new inquiries of importance have come up for figures lately. Awards so far this year total 105,282 tons, compared with 23,880 tons for the same period last year.

Awards of structural shapes were the largest in over a month and aggregated 3761 tons. The Golden Gate Iron Works took 115 tons for a theater in Alameda, Calif., and 100 tons for a mess hall at San Quentin prison. Consolidated Steel Corp. booked 1715 tons for a bridge in Ventura county, Calif., over the Santa Clara river and the Herrick Iron Works secured 147 tons for an apartment in San Francisco. Bids were rejected on 175 tons for a grandstand at the Los Angeles county fair grounds. Bids are being taken on 400 tons for a plant in San Francisco for the Vermont Marble Co. Plain shapes are quoted between 2.05c and 2.15c, c.i.f.

Other Finished Material

Awards of cast iron pipe totaled 410 tons. An unknown company took 270 tons of 16-inch pipe for a sewer project in Los Angeles. A number of new inquiries have come into the market during the past ten days. San Francisco will open bids, June 29, for 2096 tons of 4 to 12-inch pipe. San Bernardino will open bids, June 23, on 810 tons, and Oakland will take bids, July 8, on 2365 tons. Burbank, Calif., has opened bids on 233 tons.

Quotations on blue annealed No. 10 gage, black and galvanized sheets, No. 24 gage, continue unchanged at 2.50c, 3.00c and 3.50c, c.i.f., respectively. Demand continues to involve small lots for the most part.

Dull in Northwest

Seattle—General conditions in the Pacific Northwest show no improvement, and consequently the iron and steel markets are inactive. Few new projects have recently been announced. Private enterprises find difficulty in obtaining financial support so that government and state work leads, constituting most of the construction under way.

Bars, Plates and Shapes

Mill prices are unchanged but inquiry has been so slack for two months that the market has had no real test. Local steel mills have taken some small orders for concrete bars but the only important prospects are 1000 tons for the Seattle marine hospital, and 340 tons for the Albro Place viaduct, Seattle, bids in.

Reclamation bureau will receive bids at Washington, July 10, for a dam at Cle Elum, Wash., involving 1700 tons of reinforcing bars, 12,860 lineal feet of sheet piling and about 300 tons of structurals. The government will furnish the materials.

The city council, Vancouver, B. C., has contracted for 11,500 feet of 24 and 30-inch steel water pipe, about 500 tons. Vancouver Engineering Works Ltd., Vancouver, will furnish 1300 feet of 30-inch electrically welded pipe, while Alcock, Downing & Wright, Vancouver, will furnish 4200 feet of 24-inch British Mannesmann seamless pipe.

About 1500 tons of plates and shapes are involved in three cranes for the navy department, bids for which were opened at Washington, this week, for use at the Puget Sound yard. Lakeside Bridge & Steel Co., Milwaukee, was low bidder at $497,500 for the three cranes. Star Iron & Steel Co., Tacoma, Wash., submitted low bids for the two small cranes at $41,300 and $53,400.

Fabricating plants in this district are running short of work as pending contracts approach completion. No projects are up for figures. Recent lettings have been of less than 100 tons each.

Finished Materials

The jobbing situation in Seattle is most unsatisfactory, with price levels unsettled and open quotations prevailing. Buyers are shopping their small orders and purchasing at rock bottom. The volume has decreased since the local disruption and business is at a standstill except for immediate necessities. At Portland, Oreg., dealers are making a determined effort to maintain price stability.

Pipe Demand Is Light

Pacific States Cast Iron Pipe Co., Provo, Utah, is reported to have the contract for furnishing 6000 feet of 6-inch cast iron pipe, 75 tons, for a government improvement at La Push, Wash. La Conner, Wash., will open bids this week for 241 tons of cast iron pipe, and Ellensburg, Wash., has opened bids for 1050 feet of 12-inch cast iron pipe, also gates, hydrants, etc. No new pipe projects have been announced.

Old Materials

The market is stagnant, with mills having large quantities of scrap on hand and dealers generally overstocked. Prices are having a struggle to maintain even the existing low levels.

Steel, Wrought and Cast Iron Pipe, and Tubing

Welded Iron, Steel Pipe

Base Price $200 Ton

Base Discounts on steel pipe, Pittsburgh and Lorain, O., to jobbers in carloads. Indiana Harbor, Ind., and Evanston, Ill., 2 points less. Chicago del., 2½ points less. Wrought pipe, Pittsburgh base.

BUTT WELD

	Steel			Iron	
In.	Blk.	Gal.	In.	Blk.	Gal.
½	58	44½	½	23	5
¾	62	50½	¾	28	11
1—3	64	52½	1—1¼	31	15
			1½—2	35	18

LAP WELD

2	57	45½	2	23	9
2½—6	61	49½	2½—3½	28	13
7—8	58	45½	4—6	30	17
9—10	56	43½	7—8	29	16
11—12	55	42½	9—12	26	11

BUTT WELD

Extra strong, plain ends

½	55	44½	¼ & ⅜	+13	+48
¾	60	49½	½	23	7
1—1½	62	51½	¾	28	12
2—3	63	52½	1—2	34	18

LAP WELD

Extra strong, plain ends

2	55	44½	2	29	13
2½—4	59	48½	2½—4	34	20
4½—6	58	47½	4½—6	33	19
7—8	54	41½	7—8	31	17
9—10	47	34½	9—12	21	8
11—12	46	33½			

To large jobbers these discounts on steel pipe increased on black by 1 point and two discounts of 5 per cent; on galvanized by 1½ points with two 5 per cents. Direct mill shipments, base, 5 and 2½. On iron pipe large jobbers obtain additional discount of 1 point with 5 and 2½ per cent on black and galvanized.

BOILER TUBES

Carload Discounts, f. o. b. Pittsburgh

Lap Welded Steel		Charcoal Iron	
2—2¼	38	1¾	8
2½—2¾	46	2—2½	13
3	52	2½—2¾	16
3¼—3¾	54	3	17
4	57	3¾—3½	18
4½—6	46	4	20
1½	1	4½	21

On lots of a carload or more, above base discounts subject to preferential of two 5 per cent discounts on steel and 10 per cent on charcoal iron. Smaller quantities subject to following modifications from base discounts.

Lap Welded Steel—Under 10,000 pounds, 6 points under base and one 5 per cent; on 10,000 pounds to carload, 4 points under base and one 5 per cent; on 10,000 pounds to carload, 4 points under base and two 5 per cents. Charcoal Iron—under 10,000 pounds, 2 points under base; on 10,000 pounds to carload, base and one 5 per cent.

STANDARD COMMERCIAL SEAMLESS BOILER TUBES

COLD DRAWN

1 inch	61	3	46
1¼—1½	53	3¼—3½	48
1¾	37	4	51
2—2¼	32	4½, 5, 6	40
2½—2¾	40		

HOT ROLLED

2—2¼	38	3¼—3½	54
2½—2¾	46	4	57
3	52	4½, 5, 6	46

Subject to 5 per cent supplementary discount for carload lots. On less than 10,000 pounds, base discount reduced 6 points. On 10,000 pounds to carload, base discount reduced 4 points and one 5 per cent allowed. No extra for lengths up to and including 24 feet. Sizes smaller than 1 inch and lighter than standard gage to be held at mechanical tubes list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Tubing

Cold drawn; f.o.b. mill discounts

Random lengths over 5 ft. 55%
Selected lengths, 1—18 ft. 53%

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

Six-inch and over, Bir.	$35.00 to 36.00
Four-inch, Birmingham	39.00 to 40.00
Four-inch, Chicago	45.00 to 47.00
Six to 24-inch, Chicago	42.00 to 44.00
Six-inch and over, N. Y.	34.50 to 36.50
Four-inch, New York	39.50 to 40.50
Stand. fittings, Bir. base	$100.00

Six to 24-inch, base; over 24-inch plus $20; 4-inch, plus $10; 3-inch plus $20; gas pipe fittings, $5 higher. Class A pipe $4 higher than Class B.

Warehouse Quotations at Leading Centers, in Cents Per Pound

STEEL BARS

Baltimore	3.00c
Boston	3.265c
Buffalo	3.00c
Chattanooga	3.10c
Chicago	2.75c
Cincinnati	3.00c
Cleveland	2.75c
Detroit	2.85c
Houston	3.00c
Los Ang.	3.40c
New York‡(d)	3.10c
Philadelphia	2.60c
Pittsburgh	2.60c
Portland	3.15c
San Frans.	2.40c
Seattle	3.00c
St. Louis	3.00c
St. Paul	3.00c
Tulsa	3.65c

IRON BARS

Baltimore	3.25c
Boston	3.265c
Buffalo	3.15c
Chattanooga	3.10c
Chicago	2.75c
Cincinnati	3.00c
Detroit	3.00c
New York‡(d)	3.10c
Philadelphia	2.60c
St. Louis	3.00c
Tulsa	3.65c

REINFORC. BARS

Baltimore	2.50c-3.31c
Boston	3.265c
Buffalo	2.95c
Chattanooga	3.10c
Cincinnati	3.00c
Cleveland	2.10-2.25c
Detroit	2.85c
Houston	3.00c
Los Ang. cl.	2.40c
Los Ang. lcl.	2.70c
New York	2.65c-3.10c
Phila.	2.40c-3.00c
Pittsburgh	2.75c
San Fran. cl.	2.30c
San Fran. lcl.	2.50c
Seattle	3.00c
St. Louis	3.15c
Tulsa	3.65c
Young.	2.30c-2.60c

SHAPES

Baltimore	3.00c
Boston	3.365c
Buffalo	3.25c
Chattanooga	3.20c
Chicago	3.00c
Cincinnati	3.25c
Cleveland	2.95c
Detroit	3.10c
Houston	3.25c
Los Ang.	3.40c
New York(d)	3.10c
Philadelphia	2.50c
Pittsburgh	2.85c
Portland	3.15c
San Fran.	2.40c
Seattle	3.00c
St. Louis	3.25c
St. Paul	3.10c
Tulsa	3.75c

PLATES

Baltimore	3.00c
Boston	3.365c
Buffalo	3.25c
Chattanooga	3.20c
Chicago	3.00c
Cincinnati	3.25c
Cleveland, ¼-in. and thicker	2.95c
Clev., 3/16-in.	3.20c
Detroit	3.10c
Det., 3/16-in.	3.10c
Houston	3.00c
Los Angeles	3.40c
New York(d)	3.30c
Philadelphia	2.50c
Phila. floor	5.10c
Pittsburgh	2.85c
Portland	3.15c
San Fran.	2.40c
Seattle	3.00c
St. Louis	3.25c
St. Paul	3.10c
Tulsa	2.75c

NO. 10 BLUE

Baltimore	3.25c
Boston	3.915c
Buffalo	3.50c
Chattanooga	3.60c
Chicago	3.20c
Cincinnati	3.30c
Cleveland	3.00c
Detroit	3.35c
Houston	3.90c
Los Ang.	3.95c
N. Y. (d)	3.00c-3.40c
Portland	4.00c
Phila.*†	3.05c
Pitts.**	2.60c to 2.85c
San Fran.	3.65c
Seattle	3.75c
St. Louis	3.45c
St. Paul	3.40c
Tulsa	3.95c

NO. 24 BLACK

Balt.*†	3.50c
Boston	4.70c
Buffalo	3.70c
Chicago	3.55c
Cincinnati	3.75c
Cleveland	3.60c
Detroit	3.50c
Los Ang.	4.70c
New York	3.50c-3.65c
Phila.*†	3.40c
Pitts.**	3.30c
Portland	4.50c
San Fran.	4.15c
Seattle	4.25c
St. Louis	3.80c
St. Paul	3.545c
Tulsa	4.10c

NO. 24 GAL. SHEETS

Balt.*†	4.00c
Boston	5.45c
Buffalo	4.10c
Chicago (local del.)	4.35c
Chicago (outside)	4.35-4.60c
Cincinnati	4.25c
Cleveland	4.00c
Detroit	4.00c
Houston	5.40c
Los. Ang.	5.10c
New York	4.00c-4.10c
Phila.*†	3.85c
Pitts.**	3.90c
Portland	5.00c
San Fran.	4.65c
Seattle	4.75c
St. Louis	4.35c
St. Paul	4.23c
Tulsa	4.60c-4.75c

BANDS

Baltimore	3.50c
Boston	4.015c-5.00c
Buffalo	3.35c
Chattanooga	3.30c
Chicago	2.95c
Cincinnati	3.20c
Cleveland	3.00c
Det. 3/16-in. & lighter	3.15c
Houston	3.65c
Los Ang.	4.30c
New York(d)	3.40c
Philadelphia	2.90c
Pittsburgh	2.95c
Portland	3.50c
San Fran.	3.75c
Seattle	3.50c
St. Paul	3.75c
Tulsa	3.85c

HOOPS

Baltimore	3.50c
Boston	5.50c-6.00c
Buffalo	3.90c
Chicago	3.50c
Cincinnati	3.75c
Cleveland	3.55c
Det. No. 14 & lighter	3.65c
New York	3.75c
Philadelphia	3.15c
Pittsburgh	3.60c
Seattle	4.90c
St. Paul	3.75c

COLD FIN. STEEL

Rounds & Hexagons

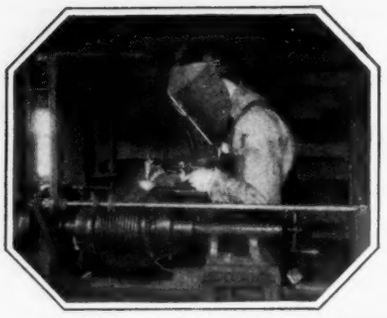
Baltimore (c)	3.30c
Boston	3.50c
Buffalo	3.15c
Chattanooga*	3.85c
Chicago	3.10c
Cincinnati	3.50c
Cleveland	3.10c
Detroit	3.65c
Los Ang. (a)	4.50c
New York	3.40c
Philadelphia*	3.40c
Pittsburgh	3.35c
Portland (a)	4.50c
San Fran.(a)	4.25c
Seattle (a)	4.50c
St. Paul (a)	3.85c
St. Louis	3.35c
Tulsa	4.75c

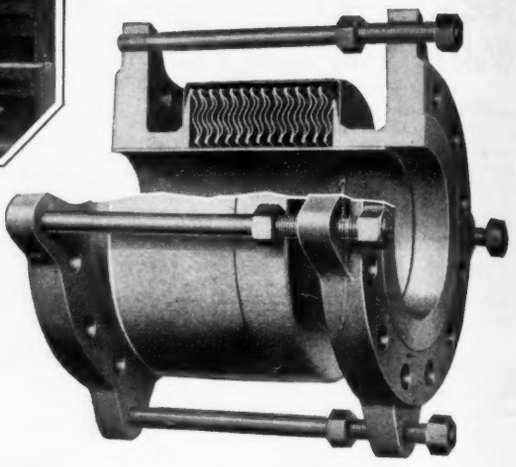
Flats and squares 50c extra, except Tulsa, where 5.14c is quoted. (a) Rounds, hex. only.

COLD ROLL. STRIP

Boston 0.100 in., 500 lb. lots	5.30c
Buffalo	5.65c
Chicago (soft) (b)	5.65c
Cincinnati	5.80c
Clev. (b)	5.55c
Detroit	5.40c
Phila. (c)	4.55c
New York	4.55c

(b) Net base straightening, cutting, boxing 1 ton or more.
(c) Plus mill, size and quantity extras.
(d) Minus quant. diff.
‡Domestic bars.
*Plus quantity extras.
**Less than 25 sheets.
*†50 or more bundles.





The Expansion Joint that "Couldn't be Welded" is now G-E Welded*

THE Croll-Reynolds Engineering Company, in developing its new Flexo Disc expansion joint, tried various types of welding processes and practically every type of electrode made here and abroad, in the attempt to weld the edges of the corrugated *nickel-steel* expansion element used in the joint.

Then, at the suggestion of a G-E welding specialist, an atomic-hydrogen arc-welding equipment was utilized. The resulting joints were remarkable. The edges had fused together perfectly in the nonoxidizing hydrogen atmosphere to produce welds without the use of filler material. These welds, after heat treatment, developed an elastic limit of 170,000 and an ultimate strength of 190,000 pounds per square inch. These physical characteristics are identical with those of the nickel steel itself.

Microphotographs reveal practically no difference in grain structure between the welded metal and the rest of the plate. As a result of these tests, G-E atomic-hydrogen sets were at once placed in the production line.

Give those "can't be welded satisfactorily" jobs to a G-E atomic-hydrogen set. Try these sets also on the general welding of steel — the results are exceptional.

The G-E sales engineer can suggest many other applications for this exclusive G-E welding equipment—ask him about it when he calls, or call him at the nearest G-E office.

*G-E Welded means "arc-welded by G-E sets with G-E electrodes."

JOIN US IN THE GENERAL ELECTRIC PROGRAM, BROADCAST EVERY SATURDAY EVENING ON A NATION-WIDE N.B.C. NETWORK

530-108

GENERAL ELECTRIC

SALES AND ENGINEERING SERVICE IN PRINCIPAL CITIES

Mill Products

Base price cents per pound f.o.b. mill, except otherwise specified. Copper and brass product prices based on 8.25c, Conn., for copper

Sheets	
Yellow brass (high)	15.62½
Copper, hot rolled	18.12½
Lead, full sheets (cut ½c more)	7.75
Zinc sheet (100-lb. base)	8.75
Tubes and Pipes	
Seamless yellow brass (high)	20.50
Seamless copper	20.62½
Rods	
Yellow brass (high, full turnings)	13.87½
Naval brass	14.87½
Anodes	
Copper, untrimmed	15.62½
Wire	
Yellow brass (high)	16.12½

Old Metals

Dealers' buying prices, cents lb.

Heavy Red Brass	
New York	5.00
Chicago	4.50 to 4.75
Cleveland	5.25 to 5.75
St. Louis	4.75
Heavy Yellow Brass	
New York	3.25
Heavy Copper and Wire	
New York	6.25
Boston	5.50 to 5.75
Chicago	4.50 to 5.00
Cleveland	5.25 to 5.75
St. Louis	5.25 to 5.50
Red Brass Borings	
New York	4.75
Yellow Brass Tubing	
Cleveland	3.25 to 3.75
Light Copper	
New York	5.25
Chicago	4.50 to 4.75
Cleveland	4.75 to 5.25
St. Louis	4.75
Light Brass	
Boston	2.25 to 2.50
Chicago	2.50 to 2.75
Cleveland	2.25 to 2.50
St. Louis	2.50 to 2.75
Zinc	
New York	1.25
Cleveland	1.25
St. Louis	1.00
Aluminum	
Clippings, soft, Cleveland	12.00 to 13.00
Clippings, hard, Cleveland	9.00 to 9.50
Borings, Cleveland	4.00 to 4.50
Mixed cast, Cleveland	4.50 to 5.00
Mixed cast, Boston	3.75 to 4.00
Mixed cast, St. Louis	4.00

Secondary Metals

Remelt aluminum No. 12	9.00 to 10.50
Brass ingots, 85-5-5-5	8.37½

Metals

Prices Rise Sharply and Sales Pick Up—Copper Exports Gain —Tin Reflects London Strength

New York—Nonferrous metals have joined other commodity and financial markets in turning decidedly stronger because of the reparations proposals of President Hoover. The prospect of more encouragement to business on account of sounder railroad conditions if freight rates are increased is another factor.

Copper—The price appeared about ready to break under 8.00c when the first intimations came of government action on debts and reparations. With more definite news on Monday, bids for copper at 8.00c were large but producers were reluctant, so the price soon went to 8.25c. Export business jumped to several thousand tons a day. The statistical situation in copper is not yet balanced, but there is some hope that new conditions will encourage consumption so that producers will be able to hold the improvement in price until shipments catch up with production.

Zinc—After prime western had slipped off to 3.30c, East St. Louis, on prompt about a week ago, the market showed more firmness at 3.35c but remained quiet for several days. On Monday, like other metals, it sold up to 3.45c but consumers did not respond so readily as in other metals. Production of zinc has been closely balanced against shipments.

Tin—Recently, the market firmed up and held steady around 23.00c, and then on Monday jumped above 24.00c. Consumers, however, were reluctant to follow the rise on Monday with the result that sales remained light. Statistics continue decidedly weak, with increases in stocks held in English warehouses of several hundred tons every week.

Lead—Buying had been fair, lately, and with the news of Monday it came with a rush. The New York price was marked up ¼-cent and the East St. Louis price 22½ points. Quotations were advanced again Tuesday.

Aluminum—Business remains light but prices are unchanged.

Coke By-Product Prices Show More Firmness

New York—Distillate prices are slightly firmer. Industrial buying of benzol is largely at 19.00c. Toluol also is firmer at 29.00c, wih demand holding up, despite apparent reduction in automobile production. Shipments of toluol continue to exceed output. Xylol and solvent naphtha are steady and unchanged in price and demand. Phenol is not active, although a fair amount of routine business is noted with the bakelite producers at 17.00c. Some best grades in small lots more at 1 cent higher. Spot buying of naphthalene holds well, exceeding expectations with some distributors. The disinfectant trade has been a steady consumer. Prices are firm and unchanged. Sulphate of ommonia is inclined to be easy with a seasonal lull in consumption.

Coke By-Products

	Spot
Per Gallon, Producers' Plants, Tank Lots	
Pure benzol	$0.18 to 0.19
90 per cent benzol	0.18 to 0.19
Toluol	0.27 to 0.29
Solvent naphtha	0.24 to 0.25
Commercial xylol	0.24 to 0.25
Per Pound at Producers' Plants in 250-Pound Drums	
Phenol	0.16 to 0.17
Per Pound at Producers' Plants	
Naphthalene flakes	3.75 to 4.75
Naphthalene balls	4.75 to 5.75
Per 100 Pounds Atlantic Seaboard	
Sulphate of ammonia	$1.675 to $1.775

Quicksilver Is $98 to $99

New York—Quicksilver is quoted at $98 to $99 per flask.

Prices of the Week, Cents a Pound

	Copper: Electro delivered	Copper: Lake delivered	Copper: Casting refinery	Straits Tin New York: Spot	Straits Tin New York: Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 98-99%	Spot Antimony	Ingot Nickel
June 17	8.00	8.12½	7.75	22.72½	22.97½	3.75	3.60	3.32½	22.90	6.02½	35.00
June 18	8.00	8.12½	7.75	22.72½	23.00	3.75	3.60	3.35	22.90	6.02½	35.00
June 19	8.00	8.12½	7.75	23.12½	23.37½	3.75	3.60	3.35	22.90	6.05	35.00
June 20	8.00	8.12½	7.75	23.00	23.25	3.75	3.60	3.37½	22.90	6.10	35.00
June 22	8.00	8.12½	8.00	24.12½	24.37½	4.00	3.82½	3.45	22.90	6.15	35.00
June 23	8.25	8.37½	8.00	24.00	24.15	4.15	3.97½	3.50	22.90	6.25	35.00

Europe

Steel Entente Likely to Be Extended—Germans Book 300,000 Tons Rolled Steel for Russia

London—(*By Cable*)—It is expected that the European steel entente, which was to expire by limitation this month, will be extended provisionally to July 31.

STEEL'S correspondent at Berlin reports industrial conditions in Germany critical. German interests have booked 300,000 tons of rolled products, valued at $7,500,000, for Russia, delivery to be completed in two months. In Belgium prices continue to decline, influenced by competition from Luxemburg. Conditions in France are unsatisfactory.

In England, production of open-hearth steel at Sheffield is at the lowest rate on record. Foreign inquiry for galvanized sheets is improving, but demand for tin plate remains dull. Four thousand tons of billets and bars were imported last week at Middlesbrough. Finished steel demand in the latter district is improving. The market for East coast hematite is weak. Continental pig iron is competing in South Wales and Scotland.

The British Mannesmann Tube Co. has resumed operations at its Llandore works. China has opened a purchasing office for railroad material in London, disposing of Boxer indemnity funds.

European Steel Prices Below Prewar; Sales Light

London—Apart from a few occasional spurts of business, dullness continues to pervade the European iron and steel export centers. While the actual volume of business is definitely unsatisfactory, the prices at which sales are effected are the lowest on record, even in comparison with those of prewar years, and the present tendency does not show definite signs of a break in the downward trend, although it is acknowledged on all sides the present export prices are not sufficient to cover production costs.

The lowering of prices has been particularly prevalent on the Continent, especially in Belgium and France, while British exporters have not followed the movement, with the result that there is a considerable margin between British and Continental prices. Many German works, on the other hand, refuse to quote at the present level and have retired from the market; only those absolutely in need of orders to keep plants running are willing to accept business at such low levels.

The average Continental quotation for merchant bars is £3 8s ($16.40), and even £3 7s 6d ($16.25) has been quoted. These prices are the lowest to date for this year and compare with £4 5s ($20.50) at the beginning of the year. Similar conditions apply to practically all departments. Reports from the Continent generally are pessimistic, although there is a ray of hope due to the better outlook concerning the reorganization of the steel entente. The main points of contention seem to have been overcome, and it is felt that if the Continental entente takes on a new lease of life, that event will have the effect of putting a stop to the downward movement of prices and inducing consumers to place their orders, since the present attitude on their part is partly explained by a tendency to wait, on the chance quotations may fall further.

British Ship Steel to Canada

British export business is reduced to a minimum, and Continental competition is keenly felt in the domestic market, although the dull condition of most consuming trades is such that even at current low prices little Continental material is finding its way into Great Britain at present. Just now, the market which appears to be taking the greatest tonnage of British steel is Canada, while some orders have been received from Russia for tubes and manufactured products, including a certain tonnage of steel.

The Belgian market is extremely depressed. The only point of interest is that not only does German competition seem to have disappeared for the time being from Belgium, but, in fact, some orders for German exporters are said to have been placed on the Brussels iron and steel exchange. On the other hand, there is strong com-

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, June 22	*British* Gross Tons U. K. Ports		*French* Metric Tons Channel Ports		*Belgium and Luxemburg* Metric Tons Channel Ports		*German* Metric Tons Rotterdam or North Sea Port	
Export Prices f.o.b. Ship at Port of Dispatch—By Cable		£ s d		£ s d		£ s d		£ s d
PIG IRON								
Foundry No. 3**.....	$14.24	2 18 6*	$11.57	2 7 6	$11.57	2 7 6	$12.18	2 10 0
Basic-bessemer.....	14.61	3 0 0†	11.08	2 5 6	11.08	2 5 6	13.39	2 15 0
Hematite, Phos. .02-.05	15.34	3 3 0	.....	.....	.....	.....	17.05	3 10 0
SEMIFINISHED STEEL								
Billets.....	$25.57	5 5 0	$15.10	3 2 0	$15.10	3 2 0	$15.83	3 5 0
Wire rods.....	41.40	8 10 0	24.35	5 0 0	24.35	5 0 0	24.35	5 0 0
FINISHED STEEL								
Standard rails.....	$40.18	8 5 0	$31.66	6 10 0	$31.66	6 10 0	$31.66	6 10 0
Merchant bars.....	1.63c	7 10 0	.74c	3 7 0	.74c	3 7 0	.74c	3 7 0
Structural shapes.....	1.68c	7 15 0	.72c	3 5 6	.72c	3 5 6	.73c	3 6 0
Plates.....	1.79c	8 5 0	.88c	4 0 0	.88c	4 0 0	.90c	4 2 0
Sheets, black, 24 gage	1.90c	8 15 0	1.76c	8 0 0	1.76c	8 0 0	1.84c	8 7 6
Sheets, gal., 24 ga. corr.	2.17c	10 0 0	2.20c	10 0 0	2.20c	10 0 0	2.31c	10 10 0
Bands and strips.....	2.06c	9 10 0	.91c	4 2 6	.91c	4 2 6	.94c	4 5 0
Plain wire, base.....	2.06c	9 10 0	1.10c	5 0 0	1.10c	5 0 0	1.10c	5 0 0
Galvanized wire, base..	2.39c	11 0 0	1.38c	6 5 0	1.38c	6 5 0	1.38c	6 5 0
Wire nails, base.....	2.39c	11 0 0	1.10c	5 0 0	1.10c	5 0 0	1.10c	5 0 0
Tin plate, box 108 lb...	$ 3.41	0 14 0	.....	.....	.....	.....	$ 8.28	1 14 0

Domestic Prices at Works or Furnace—Last Reported

			French Francs		Belgian Francs		Rentenmarks	
Fdy. No. 3 Pig Iron**	$14.24	2 18 6	$11.96	305(2)	$12.79	460	$18.54	78
Basic pig iron.....	14.61	3 0 0	12.74	325(1)	11.54	415	20.32	85.50
Furnace Coke.....	2.92	0 12 0	5.68	145	5.14	185	5.09	21.40
Billets.....	26.18	5 7 6	19.21	490	17.65	635	26.27	110.50
Standard rails.....	1.79c	8 5 0	1.41c	785	1.57c	1,210	1.37c	127
Merchant bars.....	1.63c	7 10 0	.81c	450	.82c	630	1.38c	128
Shapes.....	1.90c	8 15 0	.99c	550	.83c	635	1.35c	125
Plates.....	1.95c	9 0 0‡	1.26c	700	.96c	740	1.59c	149
Sheets, black, 24 gage	1.90c	8 15 0	2.15c	1,195	1.82c	1,400	1.26c	117
Sheets, gal. 24 ga., corr.	2.22c	10 5 0	2.19c	1,325	2.47c	1,900	3.56c	330
Plain wire.....	2.06c	9 10 0	1.85c	1,025	2.08c	1,600	2.24c	207
Bands and strips.....	2.06c	9 10 0	1.10c	610	1.40c	1,075	1.60c	148

*Middlesbrough; †Basic; ‡delivered; (1) Basic-bessemer; (2) Longwy. British export furnace coke £0 12s 0d ($2.92) f. o. b. Ferromanganese £16 9s 0d ($79.95) delivered Atlantic seaboard, duty-paid. German ferromanganese £9 0s 0d ($43.74) f. o. b.; **Silicon 2.50-3.00. British quotations are for basic openhearth steel. French, Belgian, Luxemburg, and German are for basic-bessemer steel.

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4411 W. National Avenue, Milwaukee, Wisconsin

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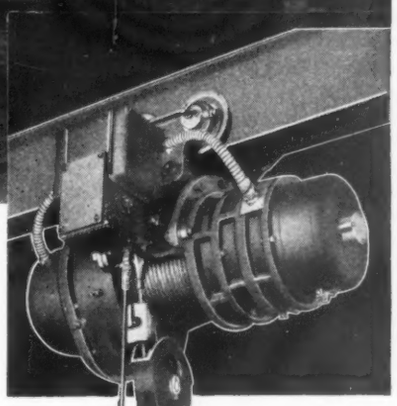


At no extra cost *"Milwaukee"* gives you push button control, roller bearings throughout, double drive hoist gearing, steel load members, alloy steel shafts and other features usually priced "extra".

A "show me" meeting, if you please.

For if you are *buying* hoists, you will want to see the outstanding features that *"Milwaukee"* gives you at no extra cost . . . And if you are not now using hoists, you will be glad to see how these moderately priced material movers cut handling costs and help to increase profits!

Traveling on an overhead monorail, these small hoists handle ¼ to 10-ton loads speedily and safely. Used with a traveling I-beam bridge, you have an inexpensive overhead crane of 5 tons capacity.

You will find these hoists the most useful equipment in your shop, shipping department or yard. They require only a small investment . . . and pay for themselves quickly.

They are available in seven styles of mounting for every possible use.

Dependable operation is built into *"Milwaukee"* Hoists by P & H, world's largest builder of cranes and hoists.

Fill in the "show me" invitation. Why not take a minute *now* . . . mail it today?

HARNISCHFEGER CORPORATION
Milwaukee Crane & Hoist Division
4411 W. National Avenue — Milwaukee, Wisconsin

▲ ▲ ▲

Traveling Cranes up to 300 Tons . . . Low Headroom Cranes 3 to 30 Tons . . . Single I-Beam Cranes ¼ to 5 Tons . . . Monorail Hoists (all types) ¼ to 10 Tons . . . Lumber Cranes . . . Bucket Cranes . . . Corduroy-Crawler Cranes . . . Gantry Cranes . . . Single Line Buckets.

HOISTS MILWAUKEE CRANES ROLLER BEARING CRANES

MILWAUKEE

petition on the part of Luxemburg. A few works in Belgium also refuse to quote at the present low level, and the Forges de Clabecq will not take any orders for merchant bars under £3 10s ($17), as a result of which action they are practically out of the market. The French are not active competitors for merchant bars, but are competing strongly for structural steel.

Conditions in Germany are dull, and naturally any export business can only be obtained at the expense of substantial price concessions in order to meet Belgian and French competition. The Germans recently sold railroad slepers at £8 10s ($41.10), cold-rolled hoops, 26-gage, at £8 12s 6d ($41.80), and open-hearth ship plates at £6 ($29.05).

The French complain that they are not receiving a sufficient volume of orders on export account, with the result that competition for domestic business is unusually keen.

Germans Attack Wages To Reduce Production Costs

Berlin — German producers are again attacking the high wages and the wage-tariffs, but the workers are seriously protesting against this attack. It is claimed that only thus can the high costs of production be reduced and a revival of activity be made possible. Consumption of steel for building purposes is by at least 30 per cent less than a year ago, and it is remarkable that the seasonal revival expected in the spring has not yet occurred. The railroads are contemplating placing orders aggregating about 200,000,000 marks, which amount is to be spent on material for permanent way, but it is not yet settled where the money is to come from to finance these orders.

Machine makers state they are now working at 44 per cent of capacity, compared with 43 per cent a month previously, this insignificant improvement being the result of better domestic purchases, export sales having declined. Steelworks are now operating at about only 40 per cent of capacity and times of delivery are therefore short, being only two weeks in many cases. At the meeting of the stockholders of the Mannesmann company it was stated that so far this year the output of pipe has had to be reduced by another 10 per cent as compared with that of the December quarter.

Export Prices Are Too Low

Export markets have not improved, and German steelmakers prefer to withdraw from the market, owing to the wholly unattractive prices. Belgian exporters are offering at a lower price than the Germans are willing to accept, this being the case for semifinished products, for which the Germans are asking £3 5s ($15.81) for billets, whereas wire rods are quoted at £5 5s ($25.54). Foreign sales of merchant bars have declined, whereas imports of this material from Belgium show a tendency to increase. Shipments to South America are handicapped by the crisis in those countries, and even sales to the Argentine Republic suffer from depreciation of currency in those countries.

Russian Plate Orders Help

Prices of plates and thin sheets have further receded, owing to reduced export sales, unsatisfactory orders from the shipyards and railroad shops. It is interesting to state that orders for boiler plates have increased, and that plants manufacturing these plates are now working at 70 to 80 per cent of capacity for the Russians.

At present it is not seen where an improvement of market conditions can come from and pessimism is spreading. Average daily production of German rolling mills during the first four months of this year was 21,794 metric tons, against 32,692 tons during the corresponding period of 1930. The situation in the pig iron market is no better.

French Steel Market Poised Ready For Slight Upturn To Bring Buying

Paris—There was no improvement in the position of the French iron and steel market during the second half of May; in fact, prices continued to fall off, particularly in the northern districts. The actual volume of orders is fairly substantial, but only for immediate requirements, and no forward business is being transacted, while at the same time warehouses are keeping stocks down and purchasing only small tonnages to hold a complete range of products. Periods of delivery are short, and the whole position tends to encourage buyers to hold back orders. It is felt that even a slight upward movement in prices would give rise to a strong current of orders. This opinion is supported by the fact that the structural steel syndicate is an exception to the rule, inasmuch as it has been booking large orders for beams, since consumers know that the price of this commodity is maintained at its present level and has little chance of falling.

Attempts are being continued to organize a syndicate for rolled bars, which would distribute orders and keep control of prices. The principle of this organization is that each works would be free to sell to its own customers on the understanding that it would not exceed a certain quota without a penalty being enforced.

In certain districts wages have been reduced, and there now are threats of strikes, particularly in the Nancy region. In the north of France textile workers have been on strike for some time, and a few metallurgical works have had to cease operating for the same reason. In the collieries the position is giving rise to anxiety, and unemployment among miners is increasing.

The price of beams is being well maintained, but there are signs of competition on the part of Belgian works in the northern districts. Merchant bars are quoted at 430 to 460 francs ($16.75 to $18) in the east, and 460 to 480 francs ($18 to $18.75) in the northern districts. The market for angles is weak and quotations of 400 francs ($15.60) have been reported. Reinforced concrete bars fluctuate between 380 and 440 francs ($14.80 and $17.20), but business is being restricted on account of the decrease in the activities of the building trade.

The plate and sheet market is unsatisfactory and syndicate prices are not being followed, as there is keen competition on the part of the Belgians in the northern districts and on the Atlantic coast. Medium-gage sheets are quoted at 700 francs ($27.25), and the basis price for the finer sizes is 800 francs $31.20). Hoops and bands are quoted at 560 to 580 francs ($21.90 to $22.60) by La Providence and Chiers.

The export market is completely disorganized, and merchant bars have been offered at £3 7s 6d ($16.30).

Tees Shipments Are Less

Birmingham, Eng.—May shipments of iron and steel from the Tees show a total fall of about 9500 tons. In the earlier months of the year the exports of steel increased with the shipment of substantial rail orders for South Africa. These have now been completed and total shipments to South and East Africa ports fell from 20,761 tons in April to 5441 tons in May. Chiefly owing to this contraction the total shipments of manufactured iron and steel fell from 45,818 tons in April to 36,332 in May, a figure still about 5000 tons above the January and February totals.

Mirrors of Motordom

(*Concluded from Page* 25)

brake drum has been one goal.

As was the case a week ago, only the impetus derived from the production of new series by Packard, Plymouth and Nash has staved off a more precipitate decline in automobile production. For the United States, output of passenger cars and trucks last week was just under 63,000 units or about 3000 units below the previous week. Indications still point to June output falling short of 275,000, which would be a reduction of 50,000 from May.

Chevrolet, with an unchanged schedule of 4000 units daily, 5 days a week, has again passed Ford, whose output becomes increasingly difficult to gage accurately because of a discrepancy between actual production of motors at Fordson and assembly of finished cars at all assembly points.

Ford is now admitting what his apologists have been denying, that a surplus of motors has been built up in recent months. It is now stated that this surplus has enabled actual motor production to be reduced to 3500 daily, while assembly is almost 7000 daily, 3 days a week.

Superficially, Chevrolet is assembling 20,000 units weekly and Ford about 17,500, but the relation on a motor basis would be nearer 20,000 to 10,500. Actual Ford production of motors will not be much over 50,000 in June, compared with 102,095 in May. Chevrolet motor production in June will approximate 85,000 units, against 113,852 in May. Claude Nellis is again in the steel purchasing division of Ford.

Says LaSalle Will Stay

Packard has stepped up to 100 units daily, 5 days a week, almost doubling its previous rate, owing to dealer requirements of the new series. Cadillac-LaSalle remains largely unchanged at about 85 units daily, 4 days. L. P. Fisher, president of the Cadillac-LaSalle division of General Motors, has taken cognizance of reports that some members of this division were to be dropped, and states that all are to be continued.

Lincoln, still the subject of reports that its prices are to be reduced and possibly a junior model brought out, is unchanged at about 25 a day, 5 days.

Plymouth, about to bring out its new line, continues on a schedule of 500 units daily, 5½ days. Its June schedule is fixed at 11,000 units and for July 15,000 tentatively. Other Chrysler units are largely unchanged, with Dodge at 110 units weekly, Chrysler 1900, and De Soto 825.

Nash, on its new series, is assembling about 400 units daily, 5½ days, a slight increase. Hudson-Essex has tapered sharply, operating only 2 days last week for a total of 750 units. Graham, which is offering a revised free wheeling device, has curtailed slightly, now producing 125 units daily, 5 days.

Durant has increased slightly to about 75 units daily, 5½ days. DeVaux-Hall has almost halved its recent rate, now being down to just below 100 units, 5½ days.

Weekly schedules of other manufacturers, largely unchanged, are Willys-Overland 2700, Studebaker 1550, Buick 1650, Auburn-Cord 1000, Hupp 350, Oakland-Pontiac 2750, Oldsmobile 1000 and Reo 475.

Marmon, which is assembling about 25 units daily, 4 days a week, has reorganized its plant operations, reduced overhead expenses and worked out a financing program with eastern banking interests which, it is claimed, will insure an operating profit.

Detroit Battling Ford

To preserve harmony between the Ford Motor Co. and Detroit appears to require continued high resolves by both sides. Detroit is aware that Henry Ford is its leading employer of labor and attempts an outward show of approval of his policies, but at times the strain is great and the veneer becomes transparent.

There has been some feeling in Detroit that the Ford interests have not assisted to the fullest in alleviating the pangs of unemployment. At the same time, there is considerable opinion even among those otherwise critical of Ford policies that the Ford principle of offering work rather than charity is correct.

With Detroit finances badly bent by payment of the equivalent of a dole through last winter, an effort has been made to increase the tax duplicate and one resort is to put the new Ford water tunnel from the Detroit river to the Fordson plant on the duplicate, even though it was put through city property.

Now there is criticism by Ford officials of the city administration's method of administering the dole, it being claimed that some persons receiving the dole were at the same time on the Ford payroll. A public statement by the Ford company points out that in 1930 it spent $374,000,000 in the greater Detroit area, of which $210,000,000 was for materials, supplies, construction and miscellaneous services, $159,000,000 for salaries and wages and $5,000,000 was taxes.

(Mirrors of Motordom will appear again next week.)

Structural Shapes

(*Concluded from Page* 53)

tural steel railing and 500 linear feet pipe railing, route 25, connecting link, sections 4B-5, Kearny, N. J., contract 52, calling for fabrication, delivery and erection of highway viaduct; bids July 6, state highway commission, Trenton, N. J.; A. Lee Grover, chief clerk.

7500 tons, Thirty-fifth street viaduct, Milwaukee.

6700 tons, estimated, bridges, Shelter Island sound, Long Island, N. Y.; bids being taken on substructures, Robinson & Steinman, New York, engineers.

3735 tons, I-beam spans, Norco, Iowa.

2500 tons, post office, Louisville, Ky.

2500 tons, bridge, Danville, Tenn., for Louisville & Nashville railroad.

2500 tons, bridge over Red river, Shreveport, La.

2000 tons, coal-breaker, Philadelphia & Reading railroad; Stone & Webster, engineers.

2000 tons, state hospital, Newtown, Conn.

1800 tons, grade crossing elimination work, Chestnut Hill, Pa., for Reading railroad; McClintic-Marshall Corp., Bethlehem, Pa., low.

1500 tons, three cranes for Puget Sound navy yard, Wash., bids in; Lakeside Bridge & Steel Co., Milwaukee, low.

1200 tons, bridge over Cuzchita river, Monroe, La.

1170 tons, bridge over Red river, Alexandria, La.

1000 tons, administration building, Bergen county, N. J.

1000 tons, bridge over Thompson river, Ashcroft, B. C., for department of public works, provincial government, Victoria, B. C.

1000 tons, grade crossing elimination work, Oakland boulevard, Detroit, for Pere Marquette railroad.

1000 tons, highway bridge, Ryan Junction, Tex.

1000 tons, New York state home economics building, Ithaca, N. Y.

750 tons, school administration building, Ardmore, Pa.; McCabe Bros., Cynwyd, Pa., general contractors.

744 tons, Madden dam, Panama; United States government to furnish most of material; bids Sept. 1. Work also includes gates, hoists and metal work.

600 tons, water tower, Century of Progress exposition, Chicago.

500 tons, school No. 129, New York.

500 tons, buildings, Seaview hospital, Staten Island, N. Y.

400 tons, state armory, Syracuse, N. Y.; W. F. Henrich Co., Cleveland, general contractor. Work also includes 45 tons concrete bars.

400 tons, armory, Peekskill, N. Y.; plans completed.

400 tons, plant for Vermont Marble Co., San Francisco; bids being taken.

400 tons, viaduct, Elmhurst, Ill.

400 tons, high school building, Whitefish Bay, Wis.

350 tons, city printing plant, Boston.

175 tons, grand stand, Los Angeles county fair ground, Pomona, Calif.; bids rejected.

165 tons, veterans' hospital buildings, Albuquerque, N. Mex.; Murch Bros. Construction Co., St. Louis, general contractor.

158 tons, three bridges for state of Ohio, includes the following: 60 tons, Hamilton county; 53 tons, Wayne county; and 45 tons, over Huron river.

107 tons, underpass at end of Harvard bridge, Cambridge, Mass.

100 tons, Elk-Abbott road viaduct, Buffalo; E. P. Lupfer Co., Buffalo, low.

100 tons, Seneca-Smith viaduct, Buffalo, E. P. Lupfer Co., Buffalo, low.

100 tons, two branch library buildings, Boston.

100 tons, nurses' home, Waverly, Mass.

Unstated tonnage, building for Cincinnati Post Publishing Co., Cincinnati.

Machinery

EXPERIENCED observers venture the opinion that, in morale as well as in volume of business, the machine tool industry reached what is destined to be recognized as its low ebb, during the first three weeks in June. That machine tool men have not lost their ability to react quickly to a favorable influence is indicated by the rebound in confidence and in the level of listed machine tool securities following announcement of the Hoover proposals for debt suspension and moratorium on reparations. There are substantial grounds for belief that these proposals go far toward reviving American machinery exports to Germany.

New York—New inquiry for machine tools largely is from navy yards and other government departments. Brooklyn yard opened recently on 15 precision lathes, these being small units for installation aboard ships. Elgin Tool Works Inc. Elgin, Ill., was low with a bid of $12,152.70. Bids varied widely, from this low figure up to a high one of approximately $25,000. Few local dealers bid. Figures went in Tuesday, June 23, on 17 engine lathes for Brooklyn, these being larger and heavier machines for yard shop installation, on which bidders were more numerous. Light house bureau, Staten Island, takes bids July 7 on three 13-inch precision geared-head engine lathes and one of 20-inch capacity all complete with motors. Several eastern navy yards also take bids July 2 for machine tools. Federal government inquiry is more active after a lull of several weeks.

General industrial inquiry shows a spotty improvement, although sales still are limited to one or two tools. June volume is holding to about the May rate, which was low. Railroads remain out of the market. Steel fabricating shops in one or two cases are showing some interest, but have taken no definite step toward buying additional equipment.

New demand for grinders has slowed up, and a report is current that buying of certain types of equipment for Russia, including grinding tools, has been held up. It now appears that some of this pending business may not be placed before fall.

One Detroit automobile builder has been buying some new tools for transmission changes. Ball bearing plants in most cases are still operating close to 40 hours a week, but on at-once current orders, there being little in the way of advanced bookings.

Worcester, Mass.—Increasing government inquiry is a hopeful feature of an otherwise dull market. Bids closed June 23 on a schedule covering lathes for Brooklyn Navy yard, and early in July bids close on another schedule covering lathes for Mare Island Navy yard and other government yards on the Pacific coast. The Naval academy at Annapolis also is in the market for a lathe.

Outside of government requirements, however, there is little inquiry. New England manufacturers are getting along with what machinery they have and continued postponement of buying at least until fall is almost certain.

Morgan Construction Co., builders of rolling mills, which began curtailment of operations about four months ago, now has reduced its force to a mere skeleton crew for maintenance of machinery and other odd jobs.

Norton Co., Heald Machine Co., and Arter Grinding Machine Co. continue production of machinery for Russia, and indications are that they will maintain present schedules throughout the summer.

Pittsburgh—Machine tool activity continues at its recent quiet rate, with orders limited to occasional purchases of individual tools and inquiry covering only small lots. Machine tool purchases by railroads are particularly scarce, while orders from other industries usually call for equipment that has been pending for some time.

Cleveland—In marked contrast to the discouragement brought on by the low ebb in their business in June, is the sudden and favorable reaction of machine tool builders to proposals of debt suspension and moratorium on reparations.

According to well founded reports from Germany during the past year, sharp resentment against tariff changes on industrial products has driven American machine tool exports to low points which never would have been reached had depression alone accounted for the curtailment. There has been machine tool business in Germany throughout the past 12 months, but by no means have American builders been getting their accustomed share.

Leading Cleveland machine tool builders have strong connections and considerable prestige in Germany, and general conviction is expressed here that goodwill engendered by the Hoover proposals will break down the barriers to this export trade.

Chicago—Arrangements are being made by the Chicago board of education to purchase about $50,000 worth of machine tools for the Austin High school on July 8. In the meantime, the financial condition of the board has made much less promising the expected inquiry for the Lane Technical High school, which had been scheduled to cost about $500,000. While work is being completed for autumn occupancy of the school building, no immediate action is expected in the equipment inquiry.

Only scattered inquiries, chiefly from light manufacturing plants, are before the market, and, with the exception of those to the tractor plant of International Harvester Co., few sales of consequence are noted. However a number of buyers seem are more willing to discuss programs contemplated within the next six months through bonafide inquiries are slow to develop.

Disappointment results from the inclination of western railroads further to postpone buying. While Santa Fe has placed the bulk of its order, a hydraulic press, radial drill and several lathes are pending and it appears that their purchase may be postponed indefinitely. Orders are not expected soon against the 50 items for the Chicago, Milwaukee, St. Paul & Pacific railroad, inquiries for which were issued about two months ago.

Lakeside Bridge & Steel Co., Milwaukee, is low bidder at $497,500 on three cranes for the Puget Sound navy yard on bids opened June 17 by the Navy department at Washington. Among the separate items on which Lakeside company is low is the largest crane at $398,500, although Star Iron & Steel Co., Tacoma, Wash., proved to be low on two smaller cranes at $41,300 and $53,400.

Machinery Orders Released For Wright Field

Washington—Contracts just placed by the government covering mechanical equipment for Wright Field, Dayton, O., include the following machine tools: Three shaping planers from Pratt & Whitney Co., Hartford, Conn., at $2075 each; and five engine lathes and five milling machines from E. A. Kinsey Co., Cincinnati, at $2825.25 each.

Construction and Enterprise

CONCISE, TIMELY BUSINESS BUILDING OPPORTUNITIES IN FIELD OF INDUSTRY

New England

BOSTON — International Harvester Co. of America, 606 South Michigan avenue, Chicago, will let contract for erection of a 1-story storage unit, 85 x 195 feet, and a service plant addition, at Everett and Beacon streets. Plans are private. Cost is estimated at about $25,000.

HAMILTON, MASS.—City building commission, J. Lamson chairman, will purchase metalworking and other equipment for a proposed school unit. Press, drills and lathes are included.

SPRINGFIELD, MASS.—Building commission, C. J. Morrow chairman, is receiving bids for a 3-story technical school to be constructed on Elliot street at a cost of about $400,000. F. W. S. King and E. C. & G. C. Gardner, 33 Lyman street, are architects.

WEST PERU, ME. — Berst-Foster Dixfield Co., F. W. Smith manager, Grand Central terminal, New York, will receive bids for a 60 x 112-foot power house and pump house to be built here. Cost is estimated at $40,000. H. F. Hallock, Oswego, N. Y., is engineer.

New York

BALDWINSVILLE—Don-Bar Mfg. Co. Inc., recently noted as considering establishment of a plant for the manufacture of pressing machinery, has purchased the site and buildings formerly used by the Penn Spring Works. Solomon Katz, Syracuse, N. Y., is interested in the company. Plant, located at Seneca river and the barge canal, contains 80,000 square feet of floor space. Equipment will be installed for the manufacture of clothes pressing machines, screens, ventilators, lawn shears and paper clips. Production, in charge of D. G. Lewis, will require 100 men. Castings will be purchased. (Noted May 14.)

BROOKLYN — Plant and machine shop of Jakobson & Peterson Inc., foot of Sixteenth avenue, recently were damaged by fire. Company repairs and builds boats.

BROOKLYN—Bureau of supplies and accounts, navy department, Washington, will receive bids July 2 on schedule 5918 for one multiple spindle drill machine, with motor and starting equipment. Bids will be received on schedule 5920 for one motor-driven radial drill press with 8-foot arm. Bids will be received on schedule 5942 for one power brake bending machine with punching attachment.

BUFFALO—A. F. Oliver Gear & Machine Co. Inc., 60 Cherry street, has plans for a 1-story plant to be built at Niagara square and Albany street. Structure will be 85 x 250 feet. Green & Son & Hopkins, 1 Niagara square, are architects.

MASPETH—Circle Flexible Conduit Co., 24-44 Woodward avenue, is having preliminary plans prepared for a plant, 94 x 100 feet, to be built at Woodward and Flushing avenues. S. Goldsmith, 4914 Church avenue, Brooklyn, N. Y., is architect. Cost, with equipment, is estimated at $40,000.

NEW YORK—City armory board will build an armory at Jamaica, L. I., to cost $1,700,000. Machine shop and mechanical departments are included in plans.

NEW YORK — Treadwell Stands Inc. has been incorporated with 100 common shares by B. Ginsburg, 1457 Broadway, to make steel grandstands.

YONKERS—Pervac Laundry Machinery Co. has been incorporated with $53,000 capital by M. S. Degenstein.

New Jersey

HOPATCONG—Hockenhos Boat Co. has been incorporated with $50,000 capital by Samuel C. Meyerson, 2 West Blackwell street, to manufacture boats.

PATERSON — Excello Machine & Welding Works Inc. has been incorporated with $25,000 capital by Stephen T. Okker, Prospect park, Paterson.

Pennsylvania

ERIE—Erie County Electric Co., Twelfth and French streets, has let contract to H. Platt Co., 1006 Palace Hardware building, for erection of a 2-story, 28 x 35-foot substation at Peach and Cherry streets. Estimated cost, $40,000.

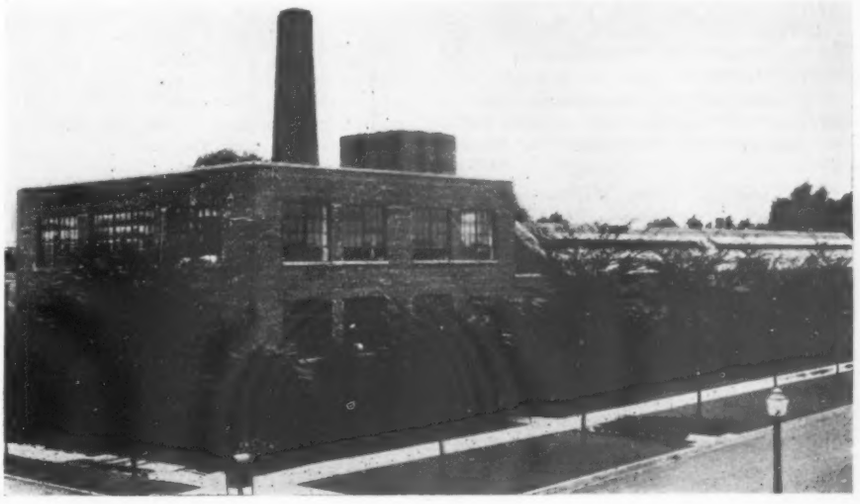
McKEESPORT—Board of education advises through W. T. Norton, secretary and business manager, that the industrial school to be erected here will not be built until next year, contract to be let in the spring of 1932. (Noted June 18.)

PHILADELPHIA—Bureau of supplies and accounts, navy department, Washington, will receive bids July 2 on schedule 5934 for one electric heavy duty, high production molder machine.

PHILADELPHIA—Boyertown Burial Case Co., E. L. Mory president, 1211 Arch street, will let contract for construction of a 3-story plant at Florist and Juniper streets. Unit will be 34 x 112 feet, to be erected according to private plans. Cost is estimated at $75,000.

PHILADELPHIA—Plant containing

KESTER SOLDER CO., Chicago, has provided maximum light and carefully planned surroundings for its new Chicago plant, which occupies a block on Wrightwood avenue. Production of self-fluxing solder requires special machines designed by company engineers. Plant units have been arranged to secure pleasant working conditions and consequent efficiency of operations. F. C. Engelhart is president of the company.



6000 square feet of floor space, located at Pickwick and Salmon streets, has been leased through the estate of John M. Kennedy Jr., Widener building, for establishment of a machine shop. After alterations and remodeling, structure will be occupied about Sept. 1.

PITTSBURGH — Standard Wire Sales Co. has been incorporated with $20,000 capital by John F. Stephens, 1432 Browning road, Pittsburgh, and J. W. Rogers, 57 Coulter street, Crafton, Pa., to manufacture and deal in machinery, parts and tools.

SHARON—H. M. Wilson, chairman, industrial committee of chamber of commerce, is reported in contact with a Pittsburgh manufacturer concerning possible acquisition of the property formerly occupied by the American Steel Foundries, on Clark street, for warehouse facilities. Four units of the plant have approximately 200,000 square feet of floor space.

SHARON—Mundorf Heating Systems Co. Inc., whose incorporation recently was noted, will start operations for the manufacture of thermo-heat cabinets for household and industrial heating. Initial operations will be confined to assembly and inspection, manufacture of all parts here to be undertaken later. E. E. Clepper, McDowell Bank building, is general manager and James Mundorf and C. L. Kemery are associated with the concern. (Noted April 9.)

WAYNE—Reading Co., Clark Dillenback engineer, Reading terminal, Philadelphia, will erect a line maintenance building here. Contract has been let to Hughes-Foulkrod Co., Schaff building, Philadelphia. Unit will be of two stories, 42 x 72 feet.

Ohio

ASHTABULA — Sanborn Motor Equipment Co. is considering erection of a new plant, plans to mature soon. Site has been purchased at Elm and Forty-eighth streets.

COLUMBUS—Columbus Steam Pump Co., 83 West Broad street, has let contract to R. H. Evans & Co., East Broad street, for a plant to be built at 724 Broderick street, construction to be started at once. Estimated cost, $6000.

COSHOCTON — Beach Enameling Co. is considering construction of a plant addition.

ELYRIA—S. S. Rockwood, clerk, board of education, will receive bids for boilers to be installed in Gates school.

HUBBARD — City, William Evans clerk, will let contract for the construction of a sewage disposal plant. Approximate cost, $50,000. Wilson Engineering Co., 209 Lincoln avenue, Youngstown, O., is engineer.

YOUNGSTOWN—Welders Mfg. Co. has been incorporated with 250 no par shares by C. L. Sowers, 1455 South avenue, and G. F. Hammond, to manufacture and deal in automobile tools, equipment and welders' supplies.

WARREN—Hilton Steel Co. has been incorporated with $35,000 capital by J. L. Hilton, A. F. Steele and George Bunting.

Indiana

ANDERSON—Guide Lamp Co. proposes to build a 2-story plant on West Twenty-fifth street. Unit will be 40 x 100 feet, and will be constructed according to private plans. Cost is estimated at $40,000.

EVANSVILLE—H. N. Robinson & Co. Inc., 801 East Michigan street, is having plans prepared for building alterations to provide more plant space. Company manufactures automatic conveyor systems, materials handling equipment and fabricates structural steel.

Michigan

DETROIT — Construction division, war department, Washington, proposes to build a post exchange, machine shop, assembly shop and air corps warehouse at Selfridge field.

DETROIT — Detroit Hydrostatic Brake Corp. has been incorporated with 30,000 no par shares by Charles T. Bush, 149 East Larned street, and Charles E. Allinger, 1225 Chicago street, to engage in mechanical engineering.

DETROIT—Standard Pattern Works, 5425 Charlevoix avenue, has been incorporated with $15,000 capital by Clarence H. Miller, 13966 Terry avenue, to engage in a general machine and foundry business.

JACKSON—City is considering erection of a sewage disposal plant, to include pump house. Cost is estimated at $700,000.

KALAMAZOO—City will erect a sewage disposal plant on North Pitcher street. Pump and control house will be included. Approximate cost, $350,000.

LANSING—New Way Engine & Machinery Co., manufacturer of air cooled engines, will add other production lines. Machine shop is to be set up in present plant space of the company. Herbert Greer is manager.

ST. CLAIR—Buhl Aircraft Co., J. J. O'Brien managing director, Marysville, Mich., will place contracts soon for erection of a plant near here for the manufacture of airplanes. Present plant output will be doubled. Cost is estimated at $100,000. Unit will be first of a group to cost $250,000.

Illinois

CHICAGO—Western Electric Co., 11 South LaSalle street, will build a welding plant, contracts for which have been let.

CHICAGO—Ansley & Baer Inc., 1141 West Sixty-ninth street, has been incorporated by Kahn, Gettleman & Kahn, City Hall Square building, to engage in sheet metal work.

CHICAGO—Banner Bed Corp., recently organized, has taken 9650 square feet of floor space at 400 North Oakley boulevard for plant operations, to include stamping, brazing and grinding.

DOWNERS GROVE—Dicke Tool Co. has been incorporated with $15,000 capital by C. H. Dicke, to engage in a tool business.

MILLSTADT—City council will receive new bids soon for a motor-driven deep well turbine pump, one motor-driven and one engine-driven service pump, steel tank and reservoir. Russell & Axon, 6200 Eastern avenue, St. Louis, are engineers.

Southern States

WASHINGTON—Bureau of supplies and accounts, navy department, Washington, will receive bids July 2 on schedule 5913 for four corrugated furnaces for Scotch boiler.

CLEARWATER, FLA. — Automatic Citrus Juice Extractor Co. has been organized here by N. M. Faulds, Clearwater, and John A. Shively, Winter Haven, Fla., to manufacture a juice extractor invented by the former.

ANNAPOLIS, MD.—Bureau of supplies and accounts, navy department, Washington, will receive bids July 2 on schedule 5930 for one 16-inch precision toolmaker's lathe. Bids will be received on schedule 5931 for one motor-driven universal cutter and tool grinder.

RIVERDALE, MD.—Robey-Lambert Diesel Engine Co. has been organized here with $50,000 capital by Albert G. Bauer, Charles A. Adami and Albert S. Roebuck, to manufacture airplanes.

GREENSBORO, N. C.—Greensboro Supply Co. is inquiring for portable electric welding machines, 200 and 300 amperes, driven by gasoline engines, and for motors, 3-phase, 60-cycle, 220-volts alternating current.

SHELBY, N. C.—George R. Spencer & Son are in the market for a 50 to 75-horsepower diesel engine and a 50 to 75-horsepower motor, 2300 volts.

COVESVILLE, VA.—Plant of the Wayland Machinery Co. recently was damaged by fire, with loss estimated at $15,000. Company manufactures apple graders.

NORFOLK, VA.—Carburetor Specialty Co. Inc. has been incorporated with $25,000 capital by J. B. Loughridge, Virginia Beach, Va., to manufacture automotive specialties.

CHESTER, W. VA.—Harker Potteries Co., East Liverpool, O., is erecting a plant addition here, 135 x 200 feet, for which motors and handling equipment will be required. Kilns have been ordered. Plant unit will cost $35,000 and equipment, $100,000.

Missouri

SPRINGFIELD — Sterling Ice Machine Co. has been incorporated by Frank W. Banfield, Enid, Okla.

ST. JOSEPH—St. Joseph Quarries Co., E. H. Lawhon president, 505 Main

street, is moving machinery to local operating field and will install additional machinery to cost $20,000. Plant is to have capacity of 60 tons per hour.

ST. LOUIS—Frost Electric Screen Mfg. Co. has been incorporated with $50,000 capital by James H. Hennessy, 6317 Washington street.

Texas

DALLAS—Power house of the local branch assembly plant of the Ford Motor Co., Fordson, Mich., recently was damaged by fire.

DALLAS—Buhl Aircraft Corp., J. J. O'Brien managing director, Marysville, Mich., proposes to locate a plant here for the assembly of planes. Ray Sharpe, company representative, is investigating sites and plant space, with Love field under consideration. Aviation committee of local chamber of commerce is aiding.

GLADEWATER — Allen Machine Shop, O. L. Hance manager, is erecting a shop building, 44 x 60 feet, for repair of oil field tools. Equipment is being moved from former shop location at Allen, Okla.

GLADEWATER—Eureka Tool Co., Drumright, Okla., is erecting a building, 36 x 110 feet, on Longview highway east of here for oil field work. Principal equipment is being moved here from Little River, Okla.

HENDERSON — Stanley Boiler & Machine Works, El Dorado, Ark., has established a branch machine shop here for welding and hardfacing work. Harold Phillips is shop foreman.

LAREDO—H. A. McFarland is considering an airport and speedway development here, and holds option on a 364-acre site. Six hangars and maintenance quarters for planes and automobiles are included in the plans. Development is to cost over $200,000. J. W. Berretta, National Bank of Commerce building, San Antonio, Tex., is architect.

LONGVIEW—Lion Tool & Supply Co. has leased a shop building, 100 x 130 feet, and will install equipment for fabricating structural and plate steel and for forging and welding. H. Lown is manager.

OVERTON—Purnell Iron Works, Guy Purnell manager, has established a shop here for repair of oil drilling equipment. Principal needs for machinery have been filled.

TYLER—Walter Connally & Co., C. Wooten shop superintendent, are adding a complete forging department to their plant here and have purchased a motor-driven steam hammer.

Wisconsin

APPLETON—City has entered, along with ten other municipalities, the Fox River Valley Municipalities association, for the building of a metropolitan sewerage system and central sewage disposal plant. Project involves a total expenditure of approximately $2,500,000.

ASHLAND — Pittsburgh & Ashland Coal & Dock Co. plans to construct and equip a briquetting plant at an approximate cost of $250,000. Construction is to start by July 1 and plant is to be in operation by Nov. 1.

BELOIT — City plans to co-operate with officials of South Beloit, Ill., in construction of a joint sewage disposal plant estimated to cost $200,000.

DRESSER JUNCTION — Trap Rock Co., 1128 Plymouth building, Minneapolis, will build a new rock crushing plant here. Cost is estimated at $65,000.

JANESVILLE—Allen-Westphal Electric Co. has been organized by W. J. Allen and Fred Westphal, formerly of Rockford, Ill., to engage in the manufacture and repair of electric motors and other electrical devices and to conduct an electric welding service. A plant is being remodeled for occupancy.

MILWAUKEE—Milwaukee sewerage commission, Jones island, is considering erection of a machine shop and service building to cost $75,000 and installation of an incinerator, costing $125,000, both at the Jones island sewage disposal plant. J. L. Ferebee is chief engineer.

Minnesota

MINNEAPOLIS—Plant of the Smith Welding Equipment Corp. recently was damaged by fire, with loss estimated at $25,000.

North Dakota

FARGO—State board of administration, E. G. Wanner secretary, Bismarck, N. D., will improve the central heating plant here according to plans being prepared. A 400-horsepower standing type boiler, traveling gate stoker and coal handling equipment will be installed. Fuel Economy Engineering Co., 400 Anchor Insurance building, St. Paul, Minn., is engineer.

Iowa

STORM LAKE—Industrial committee, chamber of commerce, is raising a fund of approximately $30,000 to secure a plant and foundry for local operations.

Kansas

DODGE CITY—Kansas Power Co., H. S. Kilby manager of operating department, Salina, Kans., will build a 2-story power plant on Ft. Dodge road here. Structure will be 50 x 125 feet. Sargent & Lundry Inc., 20 North Wacker drive, Chicago, is engineer.

ONAGA—City, L. B. Dunn clerk, will erect a municipal light and power plant, at an estimated cost of $45,000. Bond issue has been provided for.

WICHITA—C. C. Ellis, city clerk, will receive new bids July 2 for a sewage disposal plant, including pump house. Black & Veatch, 700 Mutual building, Kansas City, Mo., are engineers.

Nebraska

OMAHA—Local branch plant of the Grant Storage Battery Co., Minneapolis, recently was destroyed by fire. Loss will exceed $50,000.

Colorado

BOULDER—Public Service Co. of Colorado is remodeling its garage and carhouse to double floor space and provide room for a machine shop.

Pacific Coast

CALEXICO, CALIF.—City will make waterworks improvements and install 100-gallons per minute motor-driven pumps.

LOS ANGELES — Maine Machine Works Ltd., 701 North Main street, advises through W. W. Hartman, president, that the company is building a new plant at Central avenue and 109th street, consisting of a machine shop building, 100 x 120 feet, pattern shop, 40 x 60 feet, and miscellaneous units, including welding and grinding building, pipe slotter building and garages. Contractor is Industrial Building Co., 6624 Stanford avenue. Advice states company does not plan adding much new equipment. (Noted June 18.)

MARE ISLAND, CALIF.—Bureau of supplies and accounts, navy department, Washington, will receive bids July 2 on schedule 5940 for 300 rivet sets.

BREMERTON, WASH.—Bureau of supplies and accounts, navy department, Washington, will receive bids July 2 on schedule 5943 for two motor-driven engine lathes, with 14-inch x 8-foot bed, for delivery to the Puget Sound navy yard.

Dominion of Canada

ACTON, ONT.—Ontario Memorial Co. plans to install an electric crane in its stone-cutting plant.

BELLEVILLE, ONT.—Leaven Bros. Air Services Ltd. has been incorporated with $40,000 capital by Clarence R. Leaven, to manufacture and deal in airplanes.

BROCKVILLE, ONT.—General Combustion Co. Ltd. has been incorporated with 41,800 no par shares by I. J. Wainer, 159 Craig street west, Montreal, Que., to manufacture and deal in combustion devices and heating apparatus.

SPRAGGE, ONT.—J. J. McFadden Lumber Co. Ltd. will install equipment in a sawmill to be erected to replace the plant recently destroyed by fire. Total cost is estimated at $20,000.

TORONTO, ONT.—Spanner Battery Products Ltd. has been incorporated with $40,000 capital by Harold P.

Wright, Hamilton, Ont., as a manufacturer.

TORONTO, ONT.—Iron Fireman Mfg. Co. Inc., Portland, Oreg., manufacturer of automatic coal burners, will initiate production here. Plant has been opened at 18 Beverley street.

WINDSOR, ONT.—Viking Automatic Sprinklers Ltd. plans to build a plant. Estimated cost, $25,000.

LACHINE, QUE.—Jenkins Brothers Ltd., 617 St. Remi street, west, Montreal, Que., has let contract to A. F. Byers & Co. Ltd., 1226 University street, Montreal, for erection of a foundry here, between Rockfield and Dominion streets. Cost is estimated at $245,000. (Noted March 12.)

MONTREAL, QUE.—City is considering construction of three incinerators. D. Beaupre is city architect.

MONTREAL, QUE. — Rockbestos Products Corp., 285 Nicoll street, New Haven, Conn., advises that it will start operations here in an existing building, and will not construct or alter a plant. (Noted June 18.)

New Trade Publications

ALUMINUM PRODUCTS — Three catalogs have been issued by Aluminum Industries Inc., Cincinnati, on alloy parts, semi-steel and diachrome.

IRON PIPE—Republic Steel Corp., Youngstown, O., has issued the second edition of its booklet on Toncan iron pipe. It is filled with information bearing on the subject from various angles and is fully illustrated.

WELDED BASES—An application sheet, No. 20 in series 2, has been issued by the Lincoln Electric Co., Cleveland, devoted to the elementary classifications of bases built up by welding of structural members.

ELECTRIC FURNACES—A new bulletin on its continuous electric furnaces for heat treating strip and wire has been issued by H. O. Swoboda Inc., electrical and mechanical engineer, 3400 Forbes street, Pittsburgh. It is Bulletin 260.

GRINDING WHEELS—A booklet issued by the Norton Co., Worcester, Mass., is devoted to factors governing grinding wheel selection. It is filled with information of value to users of abrasive wheels in selecting and using the proper grade.

WATER LEVEL TELEVISORS—Schutte & Koerting Co., Philadelphia, in Bulletin 15-A describes its newly-devised water level indicator for steam boilers and other liquid containers. It is electrically operated. The bulletin is fully illustrated.

ARC WELDING—Arc welding data bulletin No. 15 of the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., contains illustrations of many unusual arc welding achievements, explains by diagram various methods of testing and discusses methods of obtaining good welds.

BELTS—A booklet devoted to considerations of proper practice in choice and use of conveyor and elevator belts has been compiled by the Diamond Rubber Co. Inc., Akron, O. It touches on practical features of design and maintenance bearing on the welfare and life of the belt itself.

BALL BEARINGS — Aetna Ball Bearing Mfg. Co., 4600 Schubert avenue, Chicago, has issued a handbook for designers and engineers, dealing with ball and roller bearings. It is the ninth edition. It presents applications of thrust and roller bearings typical mountings of both types, for unidirectional thrust and thrust from two directions. Formulas are given for calculating horsepower, torque, end thrust of worms, gears and hypoids.

PLANT CAFETERIAS — Factory Stores Co., Cleveland, has prepared a booklet describing the value of its plan of operation of cafeterias in industrial plants as a means of serving the welfare of workers. In such units established by this company 5,000,000 meals were served in 1930.

TOOLS—Eclipse Counterbore Co., Detroit, has issued a catalog, No. 32, on its line of tools, with engineering data. Additions to its line include integral solid-pilot counterbores and toolroom sets of these counterbores and two-piece core drills. It is amply illustrated.

DIE SET CHART—Danly Machine Specialties Inc., Chicago, has prepared for distribution a chart making it possible to choose any one of 20 sizes and six thickness combinations of die sets for rectangular, square and round dies. It is 11 x 17 inches and takes the place of eight sheets formerly used. It shows 1400 possible combinations.

HEAT TREATMENT CHART—W. S Rockwell Co., 50 Church street, New York, has prepared a chart, No. 237, on heavy paper for hanging in the shop. It contains all the factors ordinarily involved in the heat treatment of steel. Included are: Critical range diagram; general tempering colors; specific heats and melting points; conversion tables; heat equivalents.

MAGNETIC CLUTCHES — Cutler-Hammer Inc., Milwaukee, has issued a booklet, "Keeping Pace with Machine Design," dealing with construction, operation and application of its magnetic clutches, including the new duplex clutch. Installation photographs show their use on various machines. It is in non-technical language.

VACUUM PUMPS—Chicago Pump Co., 2336 Wolfram street, Chicago, has in preparation a catalog on its vacuum pump, designed to take the mystery out of the production of a vacuum by means of a pump, dealing with each step separately. Color is utilized in the illustrations to visualize travel of various fluids in the operation of the pump. The complete line of pumps in all sizes, drives and combinations of control, is shown, with installation diagrams, dimension diagrams, specification forms and engineering data.

MOTORS—Bulletin No. 209 by the Reliance Electric & Engineering Co., Ivanhoe Road, Cleveland, is devoted to heavy duty motors for direct current. It covers in illustration and description every step in the manufacture of the motors and shows them assembled and disassembled. Tables of engineering data and illustrations of actual installations are included.

SOAKING PITS—Surface Combustion Corp., Toledo, O., has issued a booklet on the modern soaking pit, describing a one-way fired, controlled atmosphere pit. It is prepared in a way to be of interest to men of technical training, the text being illustrated by comparative photographs and blueprints showing views of regeneral line and one-way fired pits.

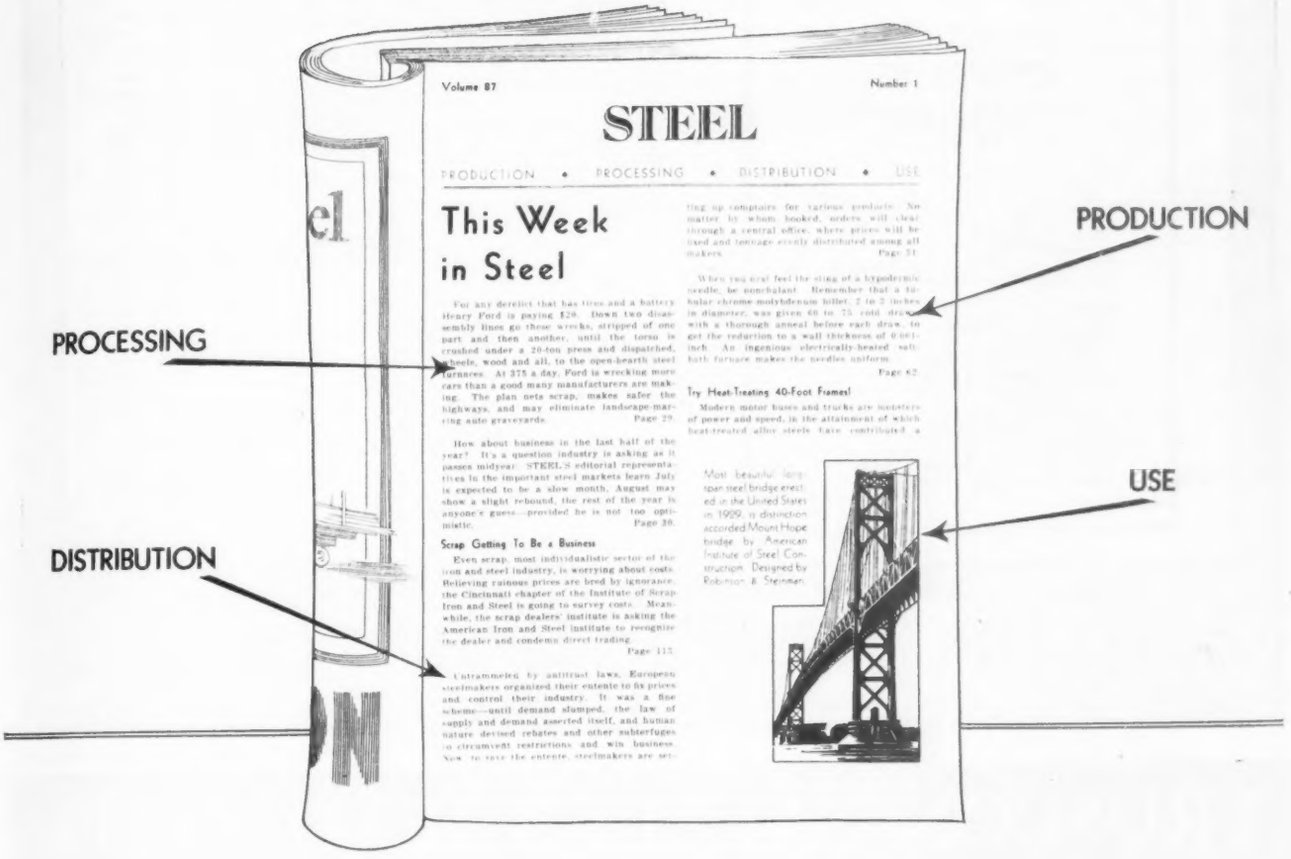
SPRINGS — Barnes - Gibson - Raymond Inc., 6400 Miller avenue, Detroit, has issued an engineering catalog of its springs. It is in loose-leaf form to provide for additional leaves in future. Photographs and data are presented to show that spring making is an art. Numerous types of springs are shown in the illustrations, classified by use.

FANS AND VENTILATION—Airplane propellor exhaust fans and ventilating equipment are described in a booklet by Propellair Inc., Columbus, O. Principles developed in perfecting the airplane propeller have been applied to fan blades for moving air for ventilating and this booklet is devoted to explanation of these principles and their practical use as adapted in the products of this company. Tables and diagrams furnish engineering data.

CAR SPOTTERS—H. W. Caldwell & Son Co., 2410 West Eighteenth street, Chicago, in book No. 1292 describes its car spotters, pointing out important features, giving dimensions, capacities, horsepowers of motor speed and other factors. Installation photographs show their uses in various applications. A chart shows a method of figuring the degree of curvature of railroad tracks and actual pull on the car spotter rope, valuable information regardless of the method used in spotting cars.

"THIS WEEK IN STEEL"

Important News at a Glance



The digest called "This Week in Steel" enables the busy executive, who has a limited time at his disposal, to "high spot" the week. Then, it refers him to other pages where the information is treated in detail.

In addition to digesting the editorial contents in the first two editorial pages, the main editorial contents are presented from an interpretive standpoint. In this manner, various data are presented more effectively with the use of fewer words, thus making the publication more valuable and attractive to the reader.

These improvements in editorial functioning and presentation enable readers to secure the desired information in less time than it required in Iron Trade Review, thus compensating for the additional time spent in reading advertisements. This permits the present intermingling of editorial and advertising pages without imposing on the reader's time.

The advertising pages today are informative and timely. The newest methods, processes, materials and equipment are presented with a minimum of detail. To keep abreast of the times the modern executive reads industrial advertising with as keen an interest as he does the editorial section.

LARGEST BUILDERS OF THE WORLD'S LARGEST CRANES

Alliance Products

STANDARD CRANES
Up to 430 tons capacity

STRIPPING CRANES
Up to 320 tons capacity

COMBINATION CHARGERS and STRIPPERS
Up to 200 tons capacity

Ladle Cranes
Ingot Strippers
Soaking Pit Cranes
Open Hearth Charging Machines
Slab and Billet Charging and Drawing Machines
Gantry Cranes
Ore and Coal Bridges
Car Dumpers
Forging Manipulators
Steam Drop Forge Hammers
Coke Pushers, Levelers and Door Lifters
Coal Pier Equipment
Rolling Mill Machinery
Cement Plant Machinery
Dock Handling Equipment
Coke Oven Equipment

271 of 100 Tons Capacity and over

LADLE AND STANDARD CRANES

59		100 tons
2	WORM DRIVEN Ladle,	100 tons
2		115 tons
6	WORM DRIVEN Ladle,	125 tons
45		125 tons
30		150 tons
3	WORM DRIVEN Ladle,	150 tons
6	WORM DRIVEN Ladle,	160 tons
2	WORM DRIVEN Ladle,	165 tons
4	WORM DRIVEN Ladle,	175 tons
27		175 tons
3	WORM DRIVEN Ladle,	200 tons
4		200 tons
5		225 tons
1		250 tons
3	WORM DRIVEN Ladle,	250 tons
3	WORM DRIVEN Ladle,	275 tons
1		275 tons
1		300 tons
3		430 tons

STRIPPING CRANES

8		100 tons
1		125 tons
21		150 tons
19		200 tons
1	Single Ram,	320 tons

COMBINATION CHARGERS AND STRIPPERS

3		100 tons
1		125 tons
3		150 tons
4		200 tons

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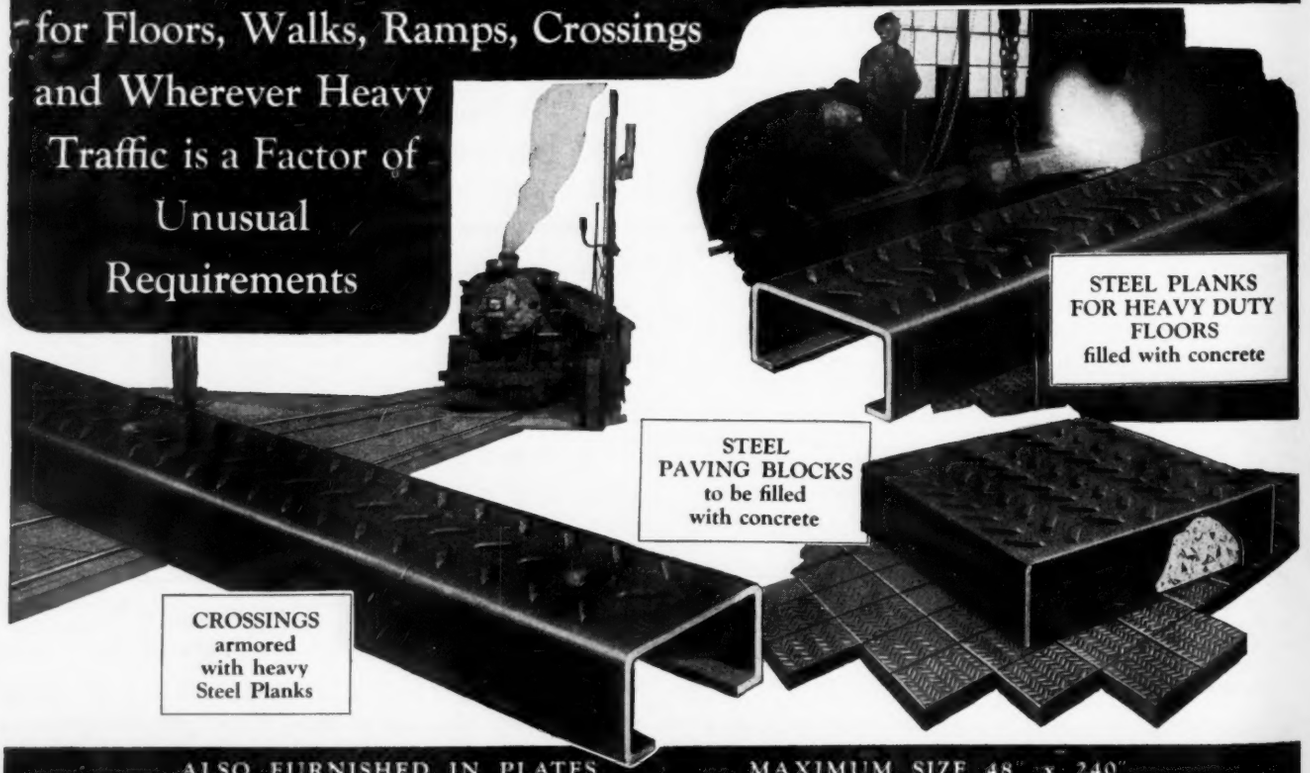
THE ALLIANCE MACHINE CO.
ALLIANCE, OHIO, U.S.A.
ENGINEERS AND BUILDERS

TRUSCON SAFETY-TREAD STEEL

for Floors, Walks, Ramps, Crossings and Wherever Heavy Traffic is a Factor of Unusual Requirements



STEEL PLANKS FOR HEAVY DUTY FLOORS filled with concrete

STEEL PAVING BLOCKS to be filled with concrete

CROSSINGS armored with heavy Steel Planks

ALSO FURNISHED IN PLATES MAXIMUM SIZE 48" x 240"

TRUSCON STEEL COMPANY, YOUNGSTOWN, OHIO

WHERE-TO-BUY

A classified list of advertisers according to products. ¶Index to advertisements gives page number of any advertiser.

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Carborundum Co., The, Niagara Falls, N. Y.
Norton Co., Worcester, Mass.

ACCUMULATORS
Birdsboro Steel Foundry & Mach. Co., Birdsboro, Pa.
Logemann Brothers Co., 3126 Burleigh St., Milwaukee.
United Engr. & Fdry. Co., Farmers Bk. Bldg., Pittsburgh, Pa.

ACETYLENE
Air Reduction Sales Co., Lincoln Bldg., E. 42nd St., New York City.
Linde Air Products Co., 30 E. 42nd St., New York City.

ACETYLENE GENERATORS
Air Reduction Sales Co., Lincoln Bldg., E. 40nd St., New York City.

ACIDS (Pickling)
American Chemical Paint Co., Ambler, Pa.

AIR COMPRESSORS—See COMPRESSORS (Air)

ALLOYS—See FERROALLOYS

ALUMINUM (Tubing)
Summerill Tubing Co., Bridgeport, Montgomery Co., Pa.

ANGLES, CHANNELS—See STEEL (Structural)

ANNEALING BOXES
Smith, George H., Steel Casting Co., Milwaukee, Wis.
Union Steel Casting Co., 62nd and Butler Sts., Pittsburgh.
United Engr. & Fdry. Co., Farmers Bk. Bldg., Pittsburgh, Pa.

ANVILS (Cast Steel)
West Steel Casting Co., 805 E. 70th St., Cleveland, O.

APPRAISALS
Brassert H. A., & Co., 310 S. Michigan Ave., Chicago, Ill.
McKee, Arthur G., & Co., 2422 Euclid Ave., Cleveland.

ARCHITECTS (Industrial)
Austin Co., The, 16112 Euclid Ave., Cleveland, O.

AXLES
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie Steel Co., 431 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 S. LaSalle St., Chicago, Ill.

BABBITT METAL
Cadman, A. W., Mfg. Co., 2816 Smallman St., Pittsburgh, Pa.

BALING PRESSES
Logemann Brothers Co., 3126 Burleigh St., Milwaukee.

BANDS (Iron and Steel)
Bethlehem Steel Co., Bethlehem, Pa.

BANDS AND HOOPS (Galvanized Strips)
Sharon Steel Hoop Co., Sharon, Pa.

BAR BENDERS
Kardong Bros., 346 Buchanan St., Minneapolis, Minn.

BARGES
Jones & Laughlin Steel Corp., Jones & Laughlin Bldg., Pittsburgh, Pa.

BARGES (Steel)
American Bridge Co., 71 Broadway, New York City.
McClintic-Marshall Corp., Bethlehem, Pa.

BARS (Alloy)
Bethlehem Steel Co., Bethlehem, Pa.
Illinois Steel Co., 208 S. LaSalle St., Chicago, Ill.
Republic Steel Corp., Youngstown, O.

BARS (Concrete Reinforcing)
Carnegie Steel Co., 431 Carnegie Bldg., Pittsburgh, Pa.
Jones & Laughlin Steel Corp., Jones & Laughlin Bldg., Pittsburgh, Pa.
Laclede Steel Co., Arcade Bldg., St. Louis, Mo.
McClintic-Marshall Corp., Bethlehem, Pa.
Republic Steel Corp., Youngstown, O.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.

BARS (Iron)—See IRON (Bar)

BARS (Steel)
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie Steel Co., 431 Carnegie Bldg., Pittsburgh, Pa.
Central Alloy Steel Corp., Massillon, O.
Illinois Steel Warehouse Co., 1319 Wabansia Ave., Chicago, Ill.
Illinois Steel Co., 208 S. LaSalle St., Chicago, Ill.
Inland Steel Co., 38 So. Dearborn St., Chicago, Ill.
Jones & Laughlin Steel Corp., Jones & Laughlin Bldg., Pittsburgh, Pa.
Republic Steel Corp., Youngstown, O.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Tennessee Coal, Iron & Railroad Co., 1351 Brown-Marx Bldg., Birmingham, Ala.
Timken Roller Bearing Co., The, Canton, O.
Weirton Steel Co., Weirton, W. Va.
Youngstown Sheet & Tube Co., Youngstown, O.

BEADING, SEAMING & WIRING MACHINERY
Quickwork Co., St. Marys, O.

BEAMS, CHANNELS, ANGLES, ETC.
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie Steel Co., 431 Carnegie Bldg., Pittsburgh, Pa.
Inland Steel Co., 38 So. Dearborn St., Chicago, Ill.
Jones & Laughlin Steel Corp., Jones & Laughlin Bldg., Pittsburgh, Pa.
McClintic-Marshall Corp., Bethlehem, Pa.
Phoenix Iron Co., The, 20 So. 15th St., Philadelphia, Pa.
Ryerson, Jos. T. & Son, Inc., 16th and Rockwell tSs., Chicago, Ill.
Weirton Steel Co., Weirton, W. Va.

BEARINGS (Ball)
Bantam Ball Bearing Co., The, South Bend, Ind.
Norma-Hoffman Bearings Corp., Stamford, Conn.

BEARINGS (Journal)
Bantam Ball Bearing Co., South Bend, Ind.
Buffalo Bronze Die Cast Corp., 100 Arthur St., Buffalo, N. Y.
Hyatt Roller Bearing Co., Harrison, N. J.
Timken Roller Bearing Co., The, Canton, O.
Tyson Roller Bearing Corp., Massillon, Ohio.

BEARINGS (Motor)
Hyatt Roller Bearing Co., Harrison, N. J.
Norma-Hoffmann Bearings Corp., Stamford, Conn.

BEARINGS (Roller)
Bantam Ball Bearing Co., The, South Bend, Ind.
Hyatt Roller Bearing Co., Harrison, N. J.
Norma-Hoffmann Bearings Corp., Stamford, Conn.
Roller Bearing Co. of America, Trenton, N. J.
Tyson Roller Bearings Corp., Massillon, Ohio.

BEARINGS (Thrust)
Bantam Ball Bearing Co., South Bend, Ind.
Norma-Hoffmann Bearings Corp., Stamford, Conn.
Timken Roller Bearing Co., The, Canton, C.
Tyson Roller Bearing Corp., Massillon, Ohio.

BEARINGS AND BUSHINGS (Brass and Bronze)
Buffalo Bronze Die Cast Corp., 100 Arthur St., Buffalo, N. Y.
Erie Bronze Co., 402 W. 19th St., Erie, Pa.

BENDING AND STRAIGHTENING MACHINES
Cleveland Punch & Shear Works Co., The, 3917 St. Clair Ave., Cleveland, O.
Hinman, D. A., & Co., Sandwich, Ill.
Kardong Bros., 346 Buchanan St., Minneapolis, Minn.
Logemann Bros. Co., 3126 Burleigh St., Milwaukee.
Long & Allstatter Co., Hamilton, O.
Sutton Engineering Co., Park Bldg., Pittsburgh, Pa.
Thomas Spacing Machine Co., Fulton Bldg., Pittsburgh.

BENZOL AND TOLUOL RECOVERY PLANTS
Koppers Const. Co., 1301 Koppers Bldg., Pittsburgh.

BILLETS (Alloy and Carbon Steel)
Republic Steel Corp., Youngstown, O.
Washburn Wire Co., Phillipsdale, R. I.

BILLETS (Forging)
Alan Wood Steel Co., Conshohocken, Pa.
Erie Forge Co., Erie, Pa.
Heppenstall Co., 47th and Hatfield, Pittsburgh, Pa.
Midvale Co., The, Nicetown, Philadelphia, Pa.

BILLETS AND BLOOMS
Alan Wood Steel Co., Conshohocken, Pa.
Bethlehem Steel Co., Bethlehem, Pa.
Illinois Steel Co., 208 South LaSalle St., Chicago, Ill.
Inland Steel Co., 38 So. Dearborn St., Chicago, Ill.

BLAST FURNACE SPECIALTIES
Bailey, Wm. M., Co., Magee Bldg., Pittsburgh.
Brosius, Edgar E., Inc., Sharpsburg P. O., Pittsburgh, Pa.

BLAST FURNACES—See FURNACES (Blast)

BLOWERS
General Electric Co., Schenectady, N. Y.

BOILER HEADS
Bethlehem Steel Co., Bethlehem, Pa.
Lukenweld, Inc., Coatesville, Pa.

BOILER SETTING & CHIMNEYS
Rust Engineering Co., 2600 Koppers Bldg., Pittsburgh.

BOILER TUBES—See TUBES (Boiler)

BOLT AND NUT MACHINERY
Landis Machine Co., Waynesboro, Pa.

BOLTS
Bethlehem Steel Co., Bethlehem, Pa.
Clark Bros. Bolt Co., Milldale, Conn.
Illinois Steel Co., 208 S. LaSalle St., Chicago, Ill.
Lamson & Sessions Co., 1971 W. 85th St., Cleveland.
Neely Nut & Bolt Co., 2101 Wharton St., Pittsburgh.
Oliver Iron & Steel Corp., S. 10th and Muriel Sts., Pittsburgh, Pa.
Republic Steel Corp., Youngstown, O.
Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.
Ryerson, Jos. T., & Sons, Inc., 16th & Rockwell Sts., Chicago.

BORING MILLS (Horizontal)
Landis Tool Co., Waynesboro, Pa.

BOXES (Carburizing)
Driver-Harris Co., Harrison, N. J.

BOXES (Open Hearth Charging)
Lukenweld, Inc., Coatesville, Pa.

BRAKES (Electric)
Clark Controller Co., 1146 E. 152 St., Cleveland, O.
Cutler-Hammer, Inc., 1265 St. Paul Ave., Milwaukee, Wis.

BRICK (Chrome)
General Refractories Co., 106 S. 16th St., Philadelphia, Pa.
Harbison-Walker Refractories Co., Farmers Bank Bldg., Pittsburgh, Pa.
Lavino, E. J., & Co., Bullitt Bldg., Philadelphia.
Stowe-Fuller Refractories Co., The, 2008 Union Trust Bldg., Cleveland, O.

BRICK (Fire Clay)
Climax Fire Brick Co., Climax, Pa.
Eureka Fire Brick Works, First National Bank Bldg., Pittsburgh, Pa.
General Refractories Co., 106 S. 16th St., Philadelphia, Pa.
Harbison-Walker Refractories Co., Farmers Bank Bldg., Pittsburgh, Pa.
Haws Refractories Co., Johnstown Savings Bank Bldg., Johnstown, Pa.
Stowe-Fuller Refractories Co., The, 2008 Union Trust Bldg., Cleveland, O.

BRICK (Insulating)—See INSULATING BRICK

BRICK (Magnesite)
General Refractories Co., 106 S. 16th St., Philadelphia, Pa.
Harbison-Walker Refractories Co., Farmers Bank Bldg., Pittsburgh, Pa.

WHERE-TO-BUY

BRICK (Silica)
Carborundum Co., The, Perth Amboy, N. J.
General Refractories Co., 106 S. 16th St., Philadelphia, Pa.
Harbison-Walker Refractories Co., Farmers Bank Bldg., Pittssburgh, Pa.
Haws Refractories Co., Johnstown Savings Bank Bldg., Johnstown, Pa.
Norton Co., Worcester, Mass.

BRIDGE CRANES (Ore and Coal Handling)
Orton Crane & Shovel Co., 608 S. Dearborn St., Chicago, Ill.
Wellman Engineering Co., 7000 Central Ave., Cleveland, O.

BRIDGES, BUILDINGS, VIADUCTS, STACKS
American Bridge Co., 71 Broadway, New York City.
Belmont Iron Works, 22nd & Washington Ave., Philadelphia, Pa.
Eichleay, John, Jr., Co., S. 20th and Wharton, Pittsburgh, Pa.
Hiner Structural Steel Co., East Ohio Gas Bldg., Canton, O.
McClintic-Marshall Corp., Bethlehem, Pa.
Morgan Engineering Co., Alliance, O.
Phoenix Bridge Co., 20 S. 15th St., Philadelphia, Pa.
Truscon Steel Co., Youngstown, O.

BRONZE (Centrifugally Cast)
Shenango-Penn Mold Co., Oliver Bldg., Pittsburgh.

BUCKETS (Clam Shell, Dragline, Grab, Single Line)
Blaw-Knox Co., 2002 Farmers Bank Bldg., Pittsburgh.
Brosius, Edgar E., Inc., Sharpsburg P. O., Pittsburgh, Pa.
Erie Construction Co., 621 Geist Rd., Erie, Pa.
Harnischfeger Corp., 4411 National Ave., Milwaukee.
Industrial Brownhoist Corp., 4403 St. Clair Ave., Cleveland, O.
Orton Crane & Shovel Co., 608 S. Dearborn St., Chicago, Ill.

BUCKETS (Dumping)
Atlas Car & Mfg. Co., 1140 Ivanhoe Rd., Cleveland, O.

BUCKETS (Elevator)
Hendrick Mfg. Co., 43 Dundaff St., Carbondale, Pa.

BUILDINGS (Industrial)
Austin Co., The, 16112 Euclid Ave., Cleveland, O.
Blaw-Knox Co., 2002 Farmers Bank Bldg., Pittsburgh, Pa.

BUILDINGS (Steel)—See BRIDGES, ETC.)

BULLDOZERS
Logemann Bros. Co., 3126 Burleigh St., Milwaukee.
Long & Allstatter Co., Hamilton, O.

BURNERS (Acetylene)—See TORCHES & BURNERS

BURNERS (Automatic)
American Heat Economy Bureau, Inc., Wabash Bldg., Pittsburgh, Pa.

BURNERS (Fuel, Oil, Gas, Combination)
Surface Combustion Co., 2375 Dorr St., Toledo, O.

BUSINESS CARDS (Engraved)
Wiggins, John B., Co., The, Fullerton & Racine Aves., Chicago, Ill.

BY-PRODUCT PLANTS
Koppers Construction Co., 1301 Koppers Bldg., Pittsburgh, Pa.

CAN MACHINERY
Bliss, E. W., Co., 53rd St., Brooklyn, N. Y.

CAP SCREWS—See SCREWS (Cap, Set, Safety)

CARBIDE
Linde Air Products Co., 30 E. 42nd St., New York City.

CAR DUMPERS
Wellman Engineering Co., 7000 Central Ave., Cleveland, O.

CAR PULLERS & SPOTTERS
Link-Belt Co., 300 W. Pershing Rd., Chicago, Ill.
Shepard Niles Crane & Hoist Co., 358 Schuyler Ave., Montour Falls, N. Y. (Shepard Crane & Hoist Div.) (Sprague Hoist Div.)

CARS (Industrial and Mining)
Atlas Car & Mfg. Co., 1140 Ivanhoe Rd., Cleveland.
Bethlehem Steel Co., Bethlehem, Pa.
Easton Car & Const. Co., 10 E. 40th St., New York.

CARS (Ingot and Open Hearth Charging)
Birdsboro Steel Fdry. & Mach. Co., Birdsboro, Pa.
Easton Car & Const., Co., 10 E. 40th St., New York.
Lukenweld, Inc., Coatesville, Pa.

CASTINGS (Acid Resisting)
Cadman, A. W., Mfg. Co., 2816 Smallman St., Pittsburgh, Pa.
International Nickel Co., 67 Wall St., New York City.
National Alloy Steel Co., Blawnox, Pa.

CASTINGS (Alloy Steel)
Alloy Cast Steel Co., The, Marion, Ohio.
Babcock & Wilcox Tube Co., Beaver Falls, Pa.
Bethlehem Steel Co., Bethlehem, Pa.
Damascus Steel Casting Co., New Brighton, Pa.
Sivyer Steel Casting Co., Milwaukee, Wis.
Treadwell Engineering Co. Easton, Pa.
Union Steel Casting Co., 62nd and Butler Sts., Pittsburgh, Pa.

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Buffalo Bronze Die Cast Corp., 100 Arthur St., Buffalo, N. Y.
Cadman, A. W., Mfg. Co., 2816 Smallman St., Pittsburgh, Pa.
Erie Bronze Co., 402 W. 19th St., Erie, Pa.

CASTINGS (Die)—See DIE CASTINGS

CASTINGS (Electric Steel)
Atlas Steel Casting Co., 1963 Elmwood Ave., Buffalo, N. Y.
Maynard Electric Steel Castings Co., 2858 So. 27th St., Milwaukee, Wis.
Pittsburgh Electric Furnace Corp., P. O. Box 1125, Pittsburgh, Pa.
Sivyer Steel Casting Co., Milwaukee, Wis.
West Steel Castings Co., 805 E. 70th St., Cleveland, O.

CASTINGS (Gray Iron)
Bethlehem Steel Co., Bethlehem, Pa.
Birdsboro Steel Foundry & Mach. Co., Birdsboro, Pa.
Forest City-Walworth Run Foundries, W. 27th and N. P. R. R., Cleveland, O.
Lake Shore Engine Works, Marquette, Mich.
Midvale Co., The, Nicetown, Philadelphia, Pa.
National Roll & Foundry Co., The, Avonmore, Pa.
Sutton Engineering Co., Park Bldg., Pittsburgh, Pa.
Treadwell Engineering Co., Easton, Pa.
United Engr. & Fdry. Co., Farmers Bank Bldg., Pittsburgh, Pa.

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Driver-Harris Co., Harrison, N. J.
National Alloy Steel Co., Blawnox, Pa.

CASTINGS (Malleable)
Iowa Malleable Iron Co., Fairfield, Iowa.
Link-Belt Co., 300 W. Pershing Rd., Chicago, Ill.
Meeker Foundry Co., Clay & Ogden Sts., Newark, N. J.
Peoria Malleable Castings Co., Peoria, Ill.
Vermilion Malleable Iron Co., 200 No. Sixth Ave., Hoopestown, Ill.

CASTINGS (Manganese Steel)
Alloy Cast Steel Co., The, Marion, Ohio.
Commercial Steel Castings Co., Marion, Ohio.
Damascus Steel Casting Co., New Brighton, Pa.

CASTINGS (Nickel Chromium)
Alloy Cast Steel Co., The, Marion, Ohio.
Driver-Harris Co., Harrison, N. J.

CASTINGS (Steel)
Allegheny Steel Co., Brackenridge, Pa.
Alloy Cast Steel Co., The, Marion, Ohio.
American Steel Foundries, 410 No. Michigan Ave., Chicago, Ill.
Atlas Steel Casting Co., 1963 Elmwood Ave., Buffalo.
Bethlehem Steel Co., Bethlehem, Pa.
Birdsboro Steel Foundry & Mach. Co., Birdsboro, Pa.
Commercial Steel Castings Co., Marion, Ohio.
Erie Forge Co., Erie, Pa.
Mackintosh-Hemphill Co., Penn Ave. at Water St., Pittsburgh, Pa.
Maynard Electric Steel Castings Co., 2558 So. 27th St., Milwaukee, Wis.
Mesta Machine Co., P. O. Box 1124, Pittsburgh, Pa.
Midvale Co., The, Nicetown, Philadelphia, Pa.
National Roll & Foundry Co., The, Avonmore, Pa.
Reliance Steel Casting Co., 28th & Smallman Sts., Pittsburgh, Pa.
Sivyer Steel Casting Co., Milwaukee, Wis.
Smith, George H., Steel Casting Co., Milwaukee, Wis.
Treadwell Engineering Co., Easton, Pa.
Union Steel Casting Co., 62nd and Butler Sts., Pittsburgh, Pa.
United Engr. & Fdry. Co., Farmers Bk. Bldg., Pittsburgh, Pa.
West Steel Castings Co., The, 805 E. 70th St., Cleveland.

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Cadman, A. W., Mfg. Co., 2816 Smallman St., Pittsburgh, Pa.

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General Refractories Co., 106 S. 16th St., Philadelphia, Pa.
Lavino, E. J., & Co., Bullitt Bldg., Philadelphia.

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COKE—See COAL AND COKE

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Wellman Engineering Co., 7000 Central Ave., Cleveland, O.

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CONCRETE REINFORCING BARS—See BARS (Concrete Reinforcing)

CONDENSERS (Surface, Barometric, Multi-Jet)
Allis-Chalmers Mfg. Co., Milwaukee, Wis.

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Youngstown Sheet & Tube Co., Youngstown, O.

CONSTRUCTION (Industrial Buildings)
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Cutler-Hammer, Inc., 1265 St. Paul Ave., Milwaukee, Wis.
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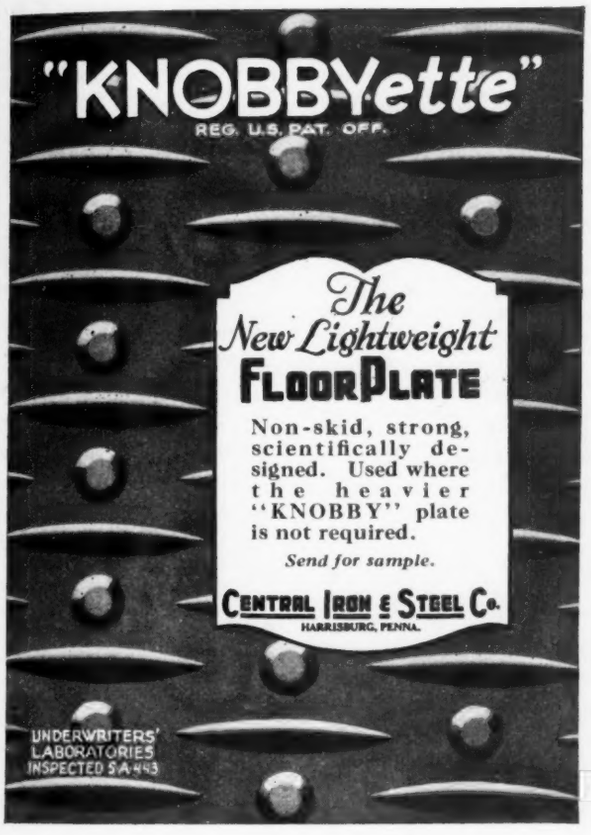
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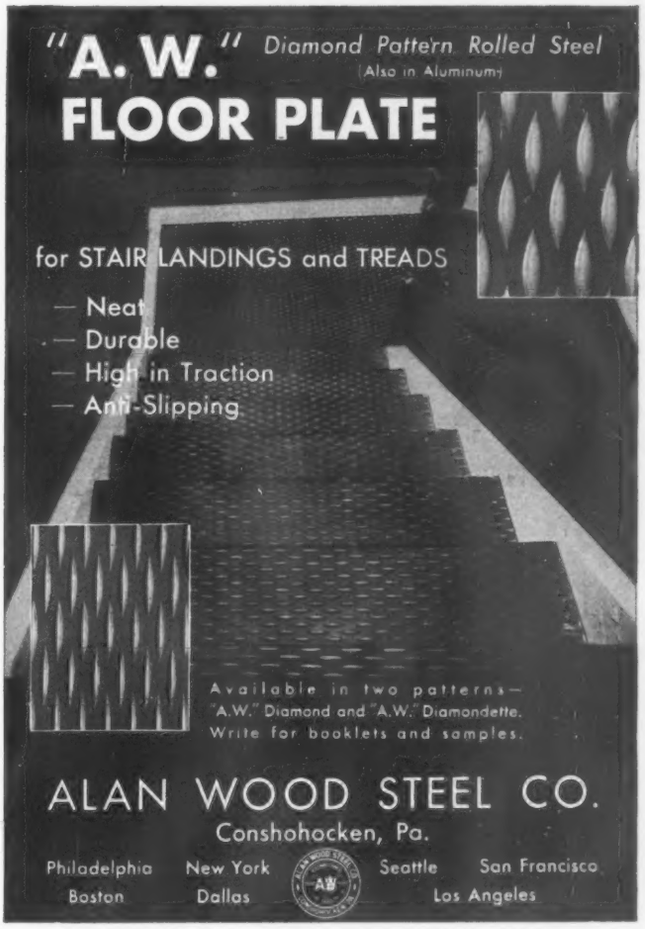

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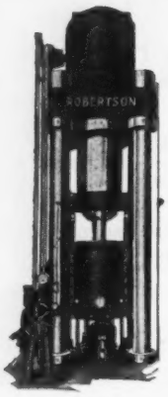

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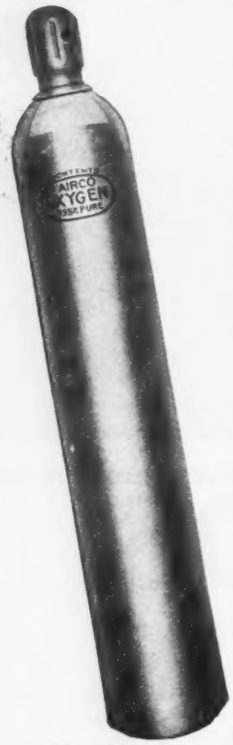

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Orton Crane & Shovel Co., 608 S. Dearborn St., Chicago, Ill.

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Euclid Crane & Hoist Co., 1365 Chardon Rd., Euclid, O.
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Morgan Engineering Co., Alliance, O.
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Robbins & Myers, Inc., Springfield, Ohio.
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Whiting Corp., Harvey Ill.

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Euclid Crane & Hoist Co., 1365 Chardon Rd., Euclid, O.
Northern Engineering Wks., 210 Chene St., Detroit.
Roeper Crane & Hoist Wks., 1729 No. 10th St., Reading, Pa.
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McKee, Arthur G., & Co., 2422 Euclid Ave., Cleveland, O.
Pennsylvania Engineering Works, New Castle, Pa.
Phoenix Bridge Co., 20 South 15th St., Philadelphia, Pa.
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Perin Engineering Co., Inc., 11 West 42nd St., New York City.

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Blaw-Knox Co., 2002 Farmers Bk. Bldg., Pittsburgh.
Carnegie Steel Co., 431 Carnegie Bldg., Pittsburgh, Pa.
Central Iron & Steel Co., Harrisburg, Pa.
Hendrick Mfg. Co., 43 Dundaff St., Carbondale, Pa.
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Philadelphia Steel & Iron Co., 1008 Commercial Trust Bldg., Philadelphia, Pa.
Queen City Forging Co., 235 Tennyson St., Cincinnati, O.
Rockford Drop Forge Co., Rockford, Ill.
Storms Drop Forge Co., 705 Page Blvd., Springfield, Mass.
Williams, J. H., & Co., 400 Vulcan St., Buffalo, N. Y.

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National Forge & Ordnance Co., Irvine, Warren Co., Pa.

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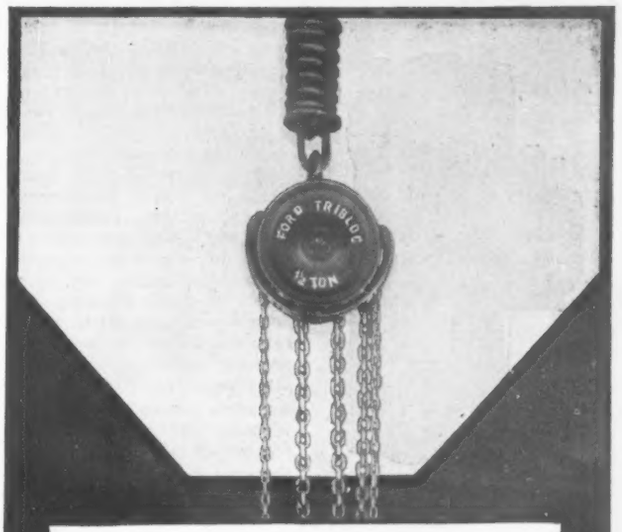

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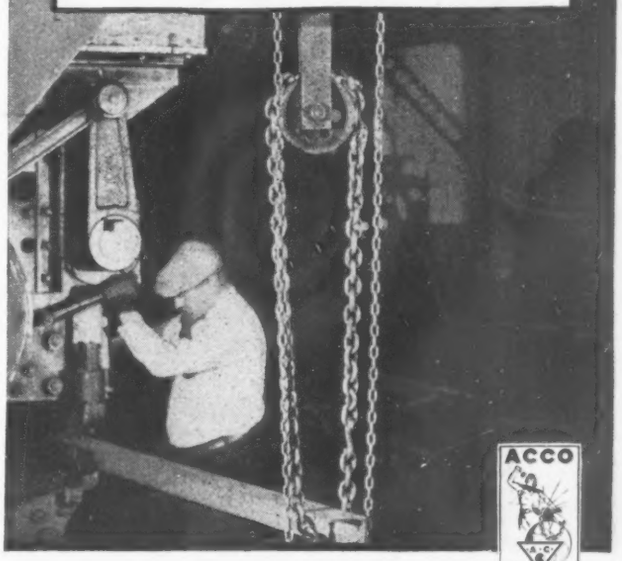

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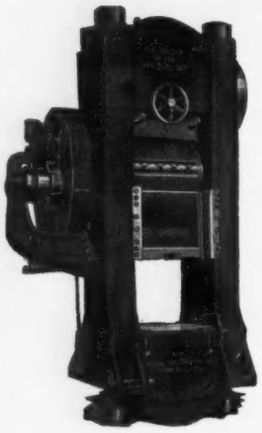

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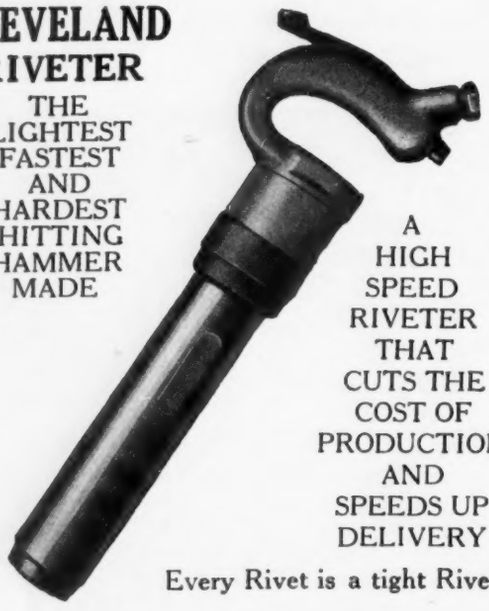

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Heppenstall Co., 47th and Hatfield St., Pittsburgh, Pa.
Mesta Machine Co., P. O. Box 1124, Pittsburgh.
Midvale Co., The, Nicetown, Philadelphia, Pa.
National Forge & Ordnance Co., Irvine, Warren Co., Pa.
Philadelphia Steel & Iron Co., 1008 Commercial Trust Bldg., Philadelphia, Pa.
Rockford Drop Forge Co., Rockford, Ill.
Williams, J. H., & Co., 400 Vulcan St., Buffalo.

FORGINGS (Upset)
Bethlehem Steel Co., Bethlehem, Pa.
Neely Nut & Bolt Co., 2101 Wharton St., Pittsburgh, Pa.

FOUR-SLIDE MACHINES
Nilson, A. H., Machine Co., Bridgeport, Conn.

FROGS AND SWITCHES
Bethlehem Steel Co., Bethlehem, Pa.

FURNACE CONTROLS (Open Hearth)
Morgan Construction Co., Worcester, Mass.

FURNACE INSULATION—See INSULATION

FURNACES (Blast)
Brassert, H. A., & Co., 310 S. Michigan Ave., Chicago.
Freyn Engineering Co., 310 S. Michigan Ave., Chicago, Ill.
McClintic-Marshall Corp., Bethlehem, Pa.
McKee, Arthur G., & Co., 2422 Euclid Ave., Cleveland.

FURNACES (Continuous Pair)
Costello Engineering Co., 519 Oliver Bldg., Pittsburgh, Pa.
Strong, Carlisle & Hammond Co., 1392 W. 3rd St., Cleveland, O.
Surface Combustion Co., 2375 Dorr St., Toledo, O.

FURNACES (Electric Heating)
Electric Furnace Co., The, Wilson St., Salem, O.
General Electric Co., Schenectady, N. Y.
Hagan, Geo. J., Co., Chamber of Commerce Bldg., Pittsburgh, Pa.
Hevi Duty Eectric Co., 4100 Highland Blvd., Milwaukee, Wis.
Holcroft & Co., 6545 Epworth Blvd., Detroit, Mich.
Strong, Carlisle & Hammond Co., 1392 W. 3rd St., Cleveland, O.
Swindell-Dressler Corp., P. O. Box 1753, Pittsburgh.

FURNACES (Electric Melting)
Ajax Electrothermic Corp., Trenton, N. J.
American Bridge Co., 71 Broadway, New York City.
General Electric Co., Schenectady, N. Y.
Pittsburgh Electric Furnace Corp., P. O. Box 1125, Pittsburgh, Pa.
Swindell-Dressler Corp., P. O. Box 1753, Pittsburgh.

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Hagan, Geo. J., Co., Chamber of Commerce Bldg., Pittsburgh, Pa.
Holcroft & Co., 6545 Epworth Blvd., Detroit, Mich.
Surface Combustion Co., 2375 Dorr St., Toledo, O.

FURNACES (Open-Hearth)
Criswell, James, Co., Keenan Bldg., Pittsburgh.
Laughlin, Alex, & Co., First National Bk. Bldg., Pittsburgh, Pa.

FURNACES (Recuperative)
Hagan, Geo. J., Co., Chamber of Commerce Bldg., Pittsburgh, Pa.
Surface Combustion Co., 2375 Dorr St., Toledo, Ohio.

FURNACES (Sheet and Tin Mills)
Aetna-Standard Engineering Co., The, Youngstown, Ohio.
Costello Engineering Co., 519 Oliver Bldg., Pittsburgh, Pa.
Hagan, Geo. J., Co., Chamber of Commerce Bldg., Pittsburgh, Pa.
Surface Combustion Co., 2375 Dorr St., Toledo, O.
Wean Engineering Co., 2nd Nat. Bk. Bldg., Warren, O.

FURNACES (Steel Mill)
General Electric Co., Schenectady, N. Y.
Hagan, Geo. J., Co., Chamber of Commerce Bldg., Pittsburgh, Pa.
Holcroft & Co., 6545 Epworth Blvd., Detroit, Mich.
Morgan Construction Co., Worcester, Mass.
Strong Carlisle & Hammond Co., 1392 W. 3rd St., Cleveland, O.
Surface Combustion Co., 2375 Dorr St., Toledo, O.
Swindell-Dressler Corp., P. O. Box 1753, Pittsburgh, Pa.

FURNACES (Steel Treating, Annealing & Case Hardening)
Carborundum Co., Perth Amboy, N. J.
Costello Engineering Co., 519 Oliver Bldg., Pittsburgh, Pa.
Electric Furnace Co., The, Wilson St., Salem, O.
General Electric Co., Schenectady, N. Y.
Hagan, Geo. J., Co., Chamber of Commerce Bldg., Pittsburgh, Pa.
Hevi Duty Electric Co., 4100 Highland Blvd., Milwaukee, Wis.
Holcroft & Co., 6545 Epworth Blvd., Detroit, Mich.
Rust Engineering Co., 2600 Koppers Bldg., Pittsburgh, Pa.
Strong, Carlisle & Hammond Co., 1392 W. 3rd St., Cleveland, O.
Surface Combustion Co., 2375 Dorr St., Toledo, O.
Swindell-Dressler Corp., P. O. Box 1753, Pittsburgh, Pa.

GALVANIZING PLANTS — FOR SHEETS
Aetna-Standard Engineering Co., The, Youngstown, O.
Erie Foundry Co., Erie, Pa.
Wean Engineering Co., 2nd Nat. Bk. Bldg., Warren, O.

GAS HOLDERS
McClintic-Marshall Corp., Bethlehem, Pa.

GAS METERS—See METERS (Gas and Air)

GAS PRODUCER PLANTS
Flinn & Dreffein Co., 308 W. Washington St., Chicago.
Koppers Construction Co., 1301 Koppers Bldg., Pittsburgh.
Morgan Construction Co., Worcester, Mass.
Wellman Engineering Co., 7000 Central Ave., Cleveland, O.

GAS RECOVERY COKE OVEN & GAS PLANTS
Koppers Construction Co., 1301 Koppers Bldg., Pittsburgh.

GAUGES (Indicating and Recording)
General Electric Co., Schenectady, N. Y.

GEAR BLANKS
Bethlehem Steel Co., Bethlehem, Pa.
Buffalo Bronze Die Cast Corp., 100 Arthur St., Buffalo, N. Y.
Lukenweld, Inc., Coatesville, Pa.

GEARS AND GEAR CUTTING
Farrel-Birmingham Co., Inc., 322 Vulcan St., Buffalo,
General Electric Co., Schenectady, N. Y.
Janes, D. O., Mfg. Co., 1120 W. Monroe St., Chicago, Ill.
Lewis Foundry & Machine Co., P. O. Box 1591, Pittsburgh, Pa.
Mackintosh-Hemphill Co., Penn Ave. at Water St., Pittsburgh, Pa.
Simonds Mfg. Co., 25th St. & Liberty Ave., Pittsburgh.
United Engineering & Foundry Co., Farmers Bank Bldg., Pittsburgh.

WHERE-TO-BUY

GENERATING SETS
General Electric Co., Schenectady, N. Y.
Reliance Electric & Engineering Co., 1082 Ivanhoe Rd., Cleveland.

GENERATORS (Acetylene)—See ACETYLENE GENERATORS

GENERATORS (Electric)
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
General Electric Co., Schenectady, N. Y.
Ideal Electric & Mfg. Co., Mansfield, O.
Lincoln Electric Co., The, Cleveland, O., Dept. 20-6.
Reliance Electric & Engineering Co. 1082 Ivanhoe Rd., Cleveland, O.
Westinghouse Elec. & Mfg. Co., E. Pittsburgh, Pa.

GRATING (Non-Slipping)
Blaw-Knox Co., 2002 Farmers Bk. Bldg., Pittsburgh, Pa.
Hendrick Mfg. Co., 43 Dundaff St., Carbondale, Pa.

GRINDERS (Electric Pneumatic, Portable)
Cleveland Pneumatic Tool Co., The, 3734 E. 78th St., Cleveland, O.

GRINDERS (Flexible Shaft)
Keller Mechanical Engr. Corp., 56 Washington St., Brooklyn, N. Y.

GRINDERS (Roll)
Farrel-Birmingham Co., Inc., 322 Vulcan St., Buffalo.

GRINDING MACHINES (Plain and Universal)
Landis Tool Co., Waynesboro, Pa.
Norton Co., Worcester, Mass.

GRINDING MACHINES (Roll)
Landis Tool Co., Waynesboro, Pa.
Norton Co., Worcester, Mass.

GRINDING MACHINES (Tool and Cutter)
Landis Tool Co., Waynesboro, Pa.
Norton Co., Worcester, Mass.

GRINDING PANS
Phillips & MacLaren Co., 24th & Smallman Sts., Pittsburgh, Pa.

GRINDING WHEELS
Carborundum Co., Niagara Falls, N. Y.
Norton Co., Worcester, Mass.

HAMMER BOARDS (Drop)
Detroit Drop Hammer Board Co., 3874 Grand River Ave., Detroit, Mich.

HAMMER RAMS
Heppenstall Co., 47th and Hatfield, Pittsburgh, Pa.

HAMMERS (Chipping, Riveting, Calking)
Cleveland Pneumatic Tool Co., 3734 E. 78th St., Cleveland, O.

HAMMERS (Drop)
Bliss, E. W., Co., 53rd and 2nd Ave., Brooklyn, N. Y.
Erie Foundry Co., Erie, Pa.
Industrial Brownhoist Corp., 4403 St. Clair Ave., Cleveland, O.
Morgan Engineering Co., Alliance, O.
Toledo Mach. & Tool Co., Toledo, O.

HAMMERS (Power)
Quickwork Co., St. Mary's, O.
Sutton Engineering Co., Park Bldg., Pittsburgh, Pa.
Yoder Co., The, W. 55th & Walworth Ave., Cleveland, O.

HAMMERS (Steam)
Alliance Machine Co., The, Alliance, O.
Erie Foundry Co., Erie, Pa.
Industrial Brownhoist Corp., 4403 St. Clair Ave., Cleveland, O.
Morgan Engineering Co., Alliance, O.

HANGERS (Door)
Myers, F. E., & Brother Co., The, Ashland, O.

HANGERS (Shift)
Hyatt Roller Bearing Co., Harrison, N. J.

HEATERS (Electric Roll)
Freyn Engineering Co., 310 S. Michigan Ave., Chicago, Ill.

HEAT TREATING (Commercial)
Lakeside Steel Improvement Co., 5418 Lakeside Ave., Cleveland, O.

HOISTING MACHINERY
Shepard Niles Crane & Hoist Co., 358 Schuyler Ave., Montour Falls, N. Y. (Shepard Crane & Hoist Div.) (Sprague Div.)

HOISTS (Chain Block)
Ford Chain Block Co., 2nd & Diamond Sts., Philadelphia, Pa.
Robbins & Myers, Inc., Springfield, Ohio.

HOISTS (Electric)
Armington Engineering Co., Chardon Rd., Euclid, O.
Box Crane & Hoist Corp., Janney & E. Ontario Sts., Philadelphia, Pa.
Cleveland Electric Tramrail, Div. of the Cleveland Crane & Engr. Co., Wickliffe, O.
Euclid Crane & Hoist Co., 1365 Chardon Rd., Euclid, O.
Harnischfeger Corp., 4411 National Ave., Milwaukee.
Northern Engineering Works, 210 Chene St., Detroit, Mich.
Robbins & Myers, Inc., Springfield, O.
Roeper Crane & Hoist Works, 1729 N. 10th St., Reading, Pa.
Shepard Niles Crane & Hoist Co., 358 Schuyler Ave., Montour Falls, N. Y. (Shepard Crane & Hoist Div.) (Sprague Hoist Div.)

HOISTS (Monorail)
Euclid Crane & Hoist Co., 1365 Chardon Rd., Euclid, O.
Ford Chain Block Co., 2nd & Diamond Sts., Philadelphia, Pa.
Shepard Niles Crane & Hoist Co., 358 Schuyler Ave., Montour Falls, N. Y. (Shepard Crane & Hoist Div.)

HOISTS (Pneumatic)
Northern Engineering Works, 210 Chene St., Detroit, Mich.

HOISTS (Screw and Differential)
Ford Chain Block Co., 2nd & Diamond Sts., Philadelphia, Pa.

HOOPS AND BANDS
Acme Steel Co., 2340 Arthur Ave., Chicago, Ill.
Ryerson, Joseph T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Sharon Steel Hoop Co., Sharon, Pa.
West Leechburg Steel Co., Farmers Bank Bldg., Pittsburgh, Pa.

HOT BEDS
Aetna-Standard Engineering Co., The, Youngstown, O.
Treadwell Engineering Co., Easton, Pa.
United Engineering & Foundry Co., Farmers Bank Bldg., Pittsburgh, Pa.

HOT BLAST STOVES
Brassert, H. A., & Co., 310 S. Michigan Ave., Chicago, Ill.
McKee, Arthur G., & Co., 2422 Euclid Ave., Cleveland.

HYDRAULIC MACHINERY
Bethlehem Steel Co., Bethlehem, Pa.
Morgan Engineering Co., Alliance, O.
Schloemann Engineering Co., Empire Bldg., Pittsburgh.

HYDRAULIC PRESSES—See PRESSES (Hydraulic)

INGOT MOLDS
Bethlehem Steel Co., Bethlehem, Pa.
Birdsboro Steel Fdry. & Mach. Co., Birdsboro, Pa.
Shenango-Penn Mold Co., Oliver Bldg., Pittsburgh.
Valley Mould & Iron Corp., Hubbard, Ohio.

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INSULATING BLOCK
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INSULATING BRICK
Armstrong Cork & Insulation Co., 920 Concord St., Lancaster, Pa.

INSULATING POWDER AND CEMENT
Armstrong Cork & Insulation Co., 920 Concord St., Lancaster, Pa.

INSULATION (Furnace, Boiler Settings, Ovens, Etc.)
Armstrong Cork & Insulation Co., 920 Concord St., Lancaster, Pa.

IRON (Bar)
Bethlehem Steel Co., Bethlehem, Pa.
Burden Iron Co., Troy, N. Y.

IRON ORE
Cleveland-Cliffs Iron Co., Union Trust Bldg., Cleveland, O.
Hanna Furnace Corp., The, Detroit, Mich.
Hillman Coal & Coke Co., 1st Nat. Bk. Bldg., Pittsburgh.
Pickands, Mather & Co., Union Trust Bldg., Cleveland, O.

KNIVES AND SHEAR BLADES —See SHEAR BLADES AND KNIVES

LATHE DOGS
West Steel Casting Co., 805 E. 70th St., Cleveland, O.
Williams, J. H., & Co., 400 Vulcan St., Buffalo.

LATHES
Ryerson, Jos. T., & Sons, Inc., 16th and Rockwell Sts., Chicago, Ill.

LATHES (Roll Turning)
Lewis Fdry. & Mach. Co., P. O. Box 1591, Pittsburgh.
United Engr. & Fdry. Co., Farmers Bank Bldg., Pittsburgh, Pa.

LEAD POTS—See POTS (Lead)

LETTERHEADS (Engraved)
Wiggins, John B., Co., The, Fullerton & Racine Aves., Chicago, Ill.

LEVELING MACHINES
Aetna-Standard Engr. Co., The, Youngstown, O.
Sutton Engineering Co., Park Ave., Pittsburgh, Pa.
United Engr. & Fdry. Co., Farmers Bk. Bldg., Pittsburgh, Pa.
Wean Engineering Co., 2nd Nat. Bk. Bldg., Warren, O.

LIFTING MAGNETS—See MAGNETS (Lifting)

LININGS (Blast Furnaces)
Haws Refractories Co., Johnstown Savings Bank Bldg., Johnstown, Pa.

LOCOMOTIVE CRANES—See CRANES (Locomotive)

LOCOMOTIVES (Electric)
Atlas Car & Mfg. Co., 1140 Ivanhoe Rd., Cleveland, O.
General Electric Co., Schenectady, N. Y.

LOCOMOTIVES (Storage Battery)
Atlas Car & Mfg. Co., 1140 Ivanhoe Rd., Cleveland, O.

LUGS (Terminal)
Wolverine Tube Co., 1435 Central Ave., Detroit, Mich.

MACHINE WORK
Air Tight Steel Tank Co., Hazelwood Branch, P. O. Box 962, Pittsburgh, Pa.
Lewis Foundry & Machine Co., P. O. Box 1591, Pittsburgh, Pa.
Sutton Engr. Co., Park Bldg., Pittsburgh, Pa.

MACHINERY (Special)
Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa.
Lewis Fdry. & Mach. Co., P. O. Box 1591, Pittsburgh.
Morgan Engineering Co., Alliance, O.
National Roll & Fdry Co., Avonmore, Pa.
Nilson, A. H., Machine Co., Bridgeport, Conn.
Sutton Engr. Co., Park Bldg., Pittsburgh, Pa.
Treadwell Engineering Co., Eaton, Pa.

MAGNETIC SEPARATORS—See SEPARATORS (Magnetic)

MAGNETS (Lifting)
Cutler-Hammer, Inc., 1265 St. Paul Ave., Milwaukee, Wis.
Electric Controller & Mfg. Co., 2698 E. 79th St., Cleveland.
Ohio Electric Mfg. Co., 5906 Maurice Ave., Cleveland, O.

MAGNESITE (Dead Burned)
General Refractories Co., 106 S. 16th St., Philadelphia.
Harbison-Walker Refractories Co., Farmers Bank Bldg., Pittsburgh, Pa.
Lavino, E. J., & Co., Bullitt Bldg., Philadelphia.

MANGANESE METALS
Electro Metallurgical Sales Corp., 30 E. 42nd St., New York City.

MANGANESE ORE
Lavino, E. J., & Co., Bullitt Bldg., Philadelphia, Pa.
Samuel, Frank, & Co., Harrison Bldg., Philadelphia.

MANIFOLDS (Oxygen)
Air Reduction Sales Co., Lincoln Bldg., E. 42nd St., New York.

MATERIAL HANDLING EQUIPMENT
Mathews Conveyer Co., Ellwood City, Pa.

MATERIAL HANDLING MACHINERY
Bartlett, C. O., & Snow Co., 6208 Harvard Ave., Cleveland, O.

METAL (Perforated)—See PERFORATED METAL

METAL CLEANERS
American Chemical Paint Co., Ambler, Pa.

METAL SPECIALTIES AND PARTS—See STAMPINGS

METAL STAMPINGS—See STAMPINGS

METAL WORKING MACHINES—See SHEET METAL WORKING MACHINERY

METALS (Nonferrous)
International Nickel Co., 67 Wall St., New York City.
Titanium Alloy Mfg. Co., Niagara Falls, N. Y.

METERS Flow)
Republic Flow Meters Co., 2235 Diversey Parkway, Chicago.

METERS (Gas and Air)
Cutler-Hammer, Inc., 1265 St. Paul Ave., Milwaukee, Wis.

MILLS (Blooming, Universal, Plate, Sheet, Tin, Bar)—see ROLLING MILL EQUIPMENT

MIXING, KNEADING, TEMPERING AND PUGGING MACHINERY
Bartlett, C. O., & Snow Co., 6203 Harvard Ave., Cleveland, O.

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MOLDING MACHINES
Herman Pneumatic Mach. Co., 806 Union Bk. Bldg., Pittsburgh, Pa.

MOLDS (Ingot)—See INGOT MOLDS

MOLYBDENUM
Vanadium Corp. of America, 120 Broadway, New York.

MONEL METAL (All Commercial Forms)
International Nickel Co., 67 Wall St., New York City.

MONORAIL SYSTEMS
Shepard Niles Crane & Hoist Co., 358 Schuyler Ave., Montour Falls, N. Y. (Shepard Crane & Hoist Div.)

MOTORS (Electric)
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Century Electric Co., 1806 Pine Ave., St. Louis, Mo.
Fairbanks, Morse & Co., 900 S. Michigan Ave., Chicago.
General Electric Co., Schenectady, N. Y.
Ideal Electric & Mfg. Co., Mansfield, Ohio.
Lincoln Electric Co., The, Cleveland, O., Dept. 20-6.
Ohio Electric Mfg. Co., The, 5906 Maurice Ave., Cleveland, O.
Reliance Electric & Engr. Co., 1082 Ivanhoe Rd., Cleveland, O.
Westinghouse Electric & Mfg. Co., E. Pittsburgh, Pa.

MUCK BAR
Bethlehem Steel Co., Bethlehem, Pa.
Samuel, Frank, & Co., Harrison Bldg., Philadelphia.

NAILS
Bethlehem Steel Co., Bethlehem, Pa.
Pittsburgh Steel Co., P. O. Box 72, Pittsburgh, Pa.
Reading Iron Co., Reading, Pa.
Youngstown Sheet & Tube Co., The, Youngstown, O.

NAILS (Coated and Galvanized)
Youngstown Sheet & Tube Co., The, Youngstown, O.

NICKEL (All Commercial Forms)
International Nickel Co., 67 Wall St., New York City.

NICKEL (Shot)
International Nickel Co., 67 Wall St., New York City.

NICKEL-CHROMIUM (Shot)
Driver-Harris Co., Harrison, N. J.

NICKEL STEEL (Cold Drawn)
Bethlehem Steel Co., Bethlehem, Pa.

NUTS
Bethlehem Steel Co., Bethlehem, Pa.
Clark Bros. Bolt Co., Milldale, Conn.
Cleveland Cap Screw Co., The 2934 E. 79th St., Cleveland, O.
Neely Nut & Bolt Co., 2101 Wharton St., Pittsburgh.
Oliver Iron & Steel Corp., S. 10th & Muriel Sts., Pittsburgh, Pa.
Republic Steel Corp., Cleveland, O.
Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.

OPEN-HEARTH FURNACES—See FURNACES (Open-Hearth)

OVENS (Coke, By-Product Recovery)
Koppers Const. Co., The, 1301 Koppers Bldg., Pittsburgh, Pa.

OVENS (Core and Mold)
Holcroft & Co., 6545 Epworth Blvd., Detroit, Mich.

OXY-ACETYLENE WELDING AND CUTTING—See WELDING

OXYGEN IN CYLINDERS
Air Reduction Sales Co., Lincoln Bldg., E. 42nd St., New York City.
Linde Air Products Co., 30 E. 42nd St., New York City.

PAINTING (Industrial)
Kiefer Sheeting & Painting Co., House Bldg., Pittsburgh, Pa.

PERFORATED METAL
Chicago Perforating Co., 2445 W. 24th Place, Chicago, Ill.
Erdle Perforating Co., 171 York St., Rochester, N. Y.
Harrington & King Perforating Co., 5634 Fillmore St., Chicago.
Hendrick Mfg. Co., 43 Dundaff St., Carbondale, Pa.
Mundt, Chas., & Sons, 55 Fairmount Ave., Jersey City, N. J.
Wickwire Spencer Steel Co., 41 E. 42nd St., New York City.

PICKLING COMPOUND
American Chemical Paint Co., Ambler, Pa.

PICKLING EQUIPMENT
International Nickel Co., 67 Wall St., New York City.

PICKLING MACHINERY
Aetna-Standard Engr. Co., The, Youngstown, O.
Mesta Machine Co., P. O. Box 1124, Pittsburgh, Pa.

PIG IRON
Alan Wood Steel Co., Conshohocken, Pa.
Bethlehem Steel Co., Bethlehem, Pa.
Cleveland-Cliffs Iron Co., Union Trust Bldg., Cleveland, O.
Globe Iron Co., Jackson, O.
Hanna Furnace Corp., The, Detroit, Mich.
Pickands, Mather & Co., Union Trust Bldg., Cleveland, O
Pilling & Co., Inc., 1500 Chestnut St., Philadelphia.
Republic Steel Corp., Youngstown, Ohio.
Rogers Brown & Crocker Bros., Inc., 21 E. 40th St., New York City.
Snyder, W. P., & Co., Oliver Bldg., Pittsburgh, Pa.
Valley Mould & Iron Corp., Hubbard, Ohio.

PIG IRON (Charcoal)
Superior Charcoal Iron Co., Grand Rapids, Mich.

PILING (Iron and Steel)
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie Steel Co., 431 Carnegie Bldg., Pittsburgh, Pa.
Jones & Laughlin Steel Corp., Jones & Laughlin Bldg., Pittsburgh, Pa.

PINIONS—See GEARS AND GEAR CUTTING

PIPE (Seamless Steel and Seamless Iron)
Babcock & Wilcox Tube Co., Beaver Falls, Pa.

PIPE (Steel)
American Solling Mill Co., Middletown, Ohio.
Babcock & Wilcox Tube Co., Beaver Falls, Pa.
Bethlehem Steel Co., Bethlehem, Pa.
Jones & Laughlin Steel Corp., Jones & Laughlin Bldg., Pittsburgh, Pa.
National Tube Co., Frick Bldg., Pittsburgh, Pa.
Pittsburgh Steel Products Co., Union Trust Bldg., Pittsburgh, Pa.
Republic Steel Corp., Youngstown, Ohio.
Youngstown Sheet & Tube Co., The, Youngstown, O.

PIPE (Wrought Iron)
Reading Iron Co., Reading, Pa.

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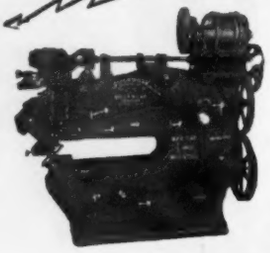

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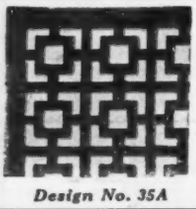

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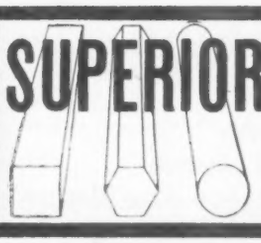
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Linde Air Products Co., 30 E. 42nd St., New York City.

WELDING FLUX—See FLUX

WELDING RODS OR WIRE
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Lincoln Electric Co., The, Cleveland, O., Dept. 20-6.
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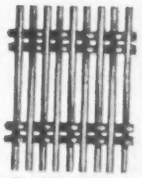

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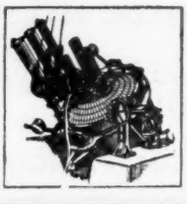
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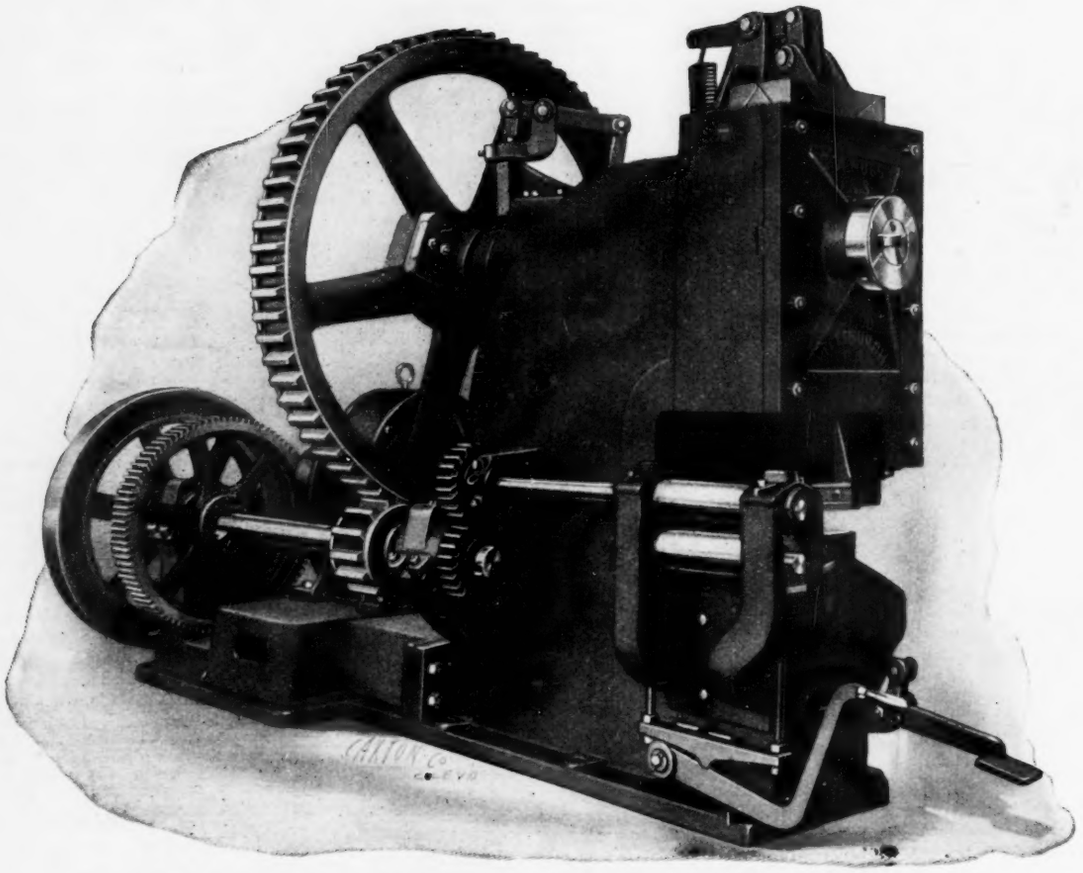

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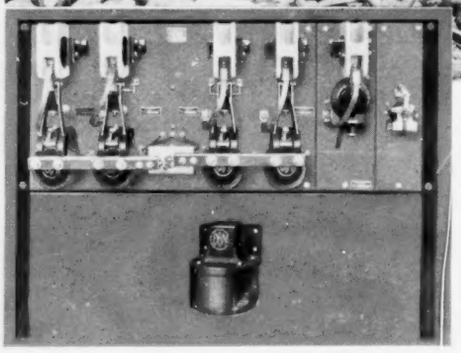

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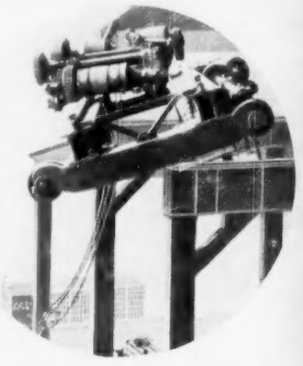

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